UNION OF SOUTH AFRICA

ANNUAL REPORT

OF THE

Department of Public Health

YEAR ENDED 30th JUNE, 1937

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Report for the Year ended 30th June, 1937.

To the Honourable the Minister of Public Health,
Pretoria.

I have the honour to submit for your information the following report on the public health of the Union and on the work of the Department for the year ended 30th June, 1937.

I. INTRODUCTORY.

Difficulties in Public Health Administration in South Africa.

In previous reports emphasis has been laid on the difficulties experienced in the administration of public health in South Africa by the allocation of different aspects of public health activities locally to so many different bodies and centrally to so many different Government Departments and Provincial Administrations.

The first realisation by the public that the system established by the South Africa Act was radically wrong was not fully appreciated until the great influenza outbreak of 1918 when the health organisation of the country completely broke down, both centrally and locally, and the resulting toll in human life finally awoke the public to the imperative necessity of creating a Central State Organisation for safeguarding the public health of South Africa; and so the Public Health Act, No. 36 of 1919, after many conferences with local authorities and the four provincial administrations, came to be passed by parliament. Under this Act the responsibility for safeguarding the public health was assigned to a special Minister administering a separate Department of State. This Act, with its amendments and allied legislation, may be regarded as the public health charter of South Africa and despite its many defects due to constitutional difficulties it remains a monument to the Honourable Sir Thomas Watt, K.C.M.G., the Minister who secured its passage through parliament and to the late Dr. J. A. Mitchell, who acted as his technical adviser and was later selected as the first Secretary for Public Health and Chief Health Officer for the Union.

This Act, at any rate, aimed mainly at achieving a healthy environment and the provision of pure food and water for everyone throughout the country. The task of endeavouring to secure a healthy environment for the population was considerably delayed by the financial depression consequent on the Great War, but with the lifting of the depression and the passage of the Slums Act, 1934, there has been real evidence of the stirring of the public conscience in matters of health and of the determination of the public to secure, at any rate, healthy environments.

The Main Functions of the Department.

The main functions of the Department, as actually laid down in the Public Health Act. No. 36 of 1919, as amended, are " to prevent or guard against the introduction of infectious diseases into the Union from outside; to promote the public health and the prevention and limitation or suppression of infectious, communicable or preventable disease within the Union; to advise and assist provincial administrations and local authorities in regard to matters affecting the public health; to promote or carry out researches and investigations in connection with the prevention or treatment of human diseases; to prepare and publish reports and statistical or other information relative to the public health, and generally to carry out in accordance with directions the powers and duties in relation to the public health conferred or imposed on the Governor-General or the Minister by this Act or otherwise ".

The main function of the Department then consists in the supervision and stimulation of local authority health activities, but a critical examination of the Act and subsequent legislation will show that the Department has also certain important executive functions. These are mainly those which none but a Central authority could possibly exercise. Thus the Department controls the port and aviation health administrations which have been set up to prevent the introduction through the agency of passengers or goods of disease into the Union from beyond its borders. It administers, with as much devolution to local authorities as is possible, the Food, Drugs and

Disinfectants Act and the regulations framed thereunder which are designed to prevent adulterated articles being imported into or manufactured in the Union.

Similarly, it has to assure itself that all therapeutic substances, such as vaccines, anti-snake bite preparations and endocrine products used for the treatment of human disease whether imported into or manufactured in the Union, are up to the required standards, and for this purpose a biological control laboratory for testing such substances is maintained in Capetown. The Department directly controls also a vaccine station for the manufacture of calf lymph for use against smallpox and two large pathological and health laboratories where medico-legal work is undertaken and where routine public health laboratory examinations are conducted.

In the public health laboratory at Capetown rabies vaccine for the Union is manufactured.

The Department is directly responsible for the control of a number of institutions, such as the national sanatorium for tuberculosis at Nelspoort and the King George V. Hospital for Tuberculosis now being built in Durban. Other institutions that may be mentioned are the five leper hospitals at Pretoria, Bochem, Emjanyana, Mkambati and Amatikulu, and the large Rietfontein Hospital near Johannesburg which serves the whole Reef with its separate divisions for formidable infectious diseases, venereal diseases and tuberculosis. Most infectious diseases hospitals are, of course, local authority institutions which are merely substantially subsidised by the Department for both capital and maintenance expenditure. Certain other institutions, such as the projected tuberculosis hospital at Lovedale are established and maintained out of moneys wholly or partly provided by the Department although the management has been vested for convenience in other bodies.

The institutions the Department controls itself are, with the exception of the leprosy institutions, those which serve a number of local authorities. They are owned and managed by the Department and the patients sent in by local authorities are paid for by those bodies at cost price less the amount of the statutory refund which would have been paid by the Government had such patients been admitted to a local authority hospital.

Leprosy is a disease for which the Government has retained direct responsibility. The policy adopted is different from that in force prior to Union. The Department now endeavours merely to isolate cases in the infectious stage only and to discharge patients as soon as they cease to be infectious with maintenance grants, if necessary, so as to enable them to live at home without having to search for work.

On the 30th June, 1937, there were only 98 European lepers in the institutions and of these six were arrested cases which had been readmitted at their own request for surgical treatment. In addition there were three cases under compulsory segregation in their homes. Further, there were 75 arrested cases in their homes of which 17 were still under surveillance and 58 definitely released from surveillance. It will thus be seen that the total number of European lepers or *ex* lepers in the Union on the 30th June, 1937, was 176, of whom 95 only were active cases of the disease. On the 30th June, 1903, there were 311 known European cases of leprosy in the four colonies under segregation either in institutions or in their homes so that it can be stated confidently that there has been a definite decline in the incidence of the disease amongst Europeans.

In the case of non-Europeans it is impossible with any certainty to make any similar statement. On the 30th June, 1937, there were 2,172 cases of the disease in the institutions. Up to this date 4,069 cases had been discharged with the disease arrested. Of these 1,711 were still under surveillance while 2,358 cases had been definitely released from further surveillance. The corresponding figures for 1903 are not comparable because in those days so many non-European lepers absconded before removal. Thus in the Native Territories of the Cape Colony during the 10 years ended 30th June, 1903, out of 1,450 non-European lepers discovered only 724 were removed to an asylum. The rest absconded.

It has become abundantly clear, however, that non-European lepers are commencing to come forward freely to the leper hospitals of their own accord so as to secure treatment and it is expected that, as a result of the departmental policy of encouraging early treatment, the disease will gradually cease to be of serious import also amongst the non-European races of the Union.

The Department is also vested with certain responsibilities for the promotion of research. It discharges this function mainly by subsidising the South African Institute for Medical Research, but some substantial research work is now being carried out in its own laboratories in Capetown. Further, a Government malaria field station is maintained at Tzaneen in the Transvaal. This must not be confused with the research station which the South African

Institute for Medical Research maintains in Natal with an entomologist in charge. Quite recently additions to the staff of the Department have been authorised to permit of the employment of an ecologist to study the habits of the fleas of the plague-carrying rodents in South Africa and also for the appointment of a dental health officer to study the distribution and causation of dental caries in the Union. A further research which it is about to initiate, with the co-operation of the provincial administrations, is an urgently needed survey of the nutritional state of the people, and for this purpose it is hoped that the Department will be enabled to make a detailed examination of a great many children of school-going age in each district so as to compare the nutritional state of one district with that of another and to determine, as far as may be possible, the remedial measures which may be indicated.

Then the Department directly controls 363 district surgeons and it subsidises approximately 170 registered nurses and midwives who have undertaken to do district work.

It has recently arranged to grant bursaries to a number of qualified non-European nurses and midwives who have undertaken to train for the health visitor's certificate of the Royal Sanitary Institute.

For the purpose of supplying the medical needs of outlying areas, the number of district surgeons is being increased and periodical tours are arranged under which district surgeons tour their districts at Government expense and attend to patients at fixed times and places *en route*.

It is for the purpose of amplifying the facilities for medical aid in the Native areas that the scheme of training medical aids at Lovedale has been initiated and it is hoped that the trainees in due course will take their place amongst the executive officers of the Department.

Propaganda also is an important function of the Department and a great many pamphlets on particular subjects are issued and it has obtained a number of films for health propaganda which are in constant circulation. The day, of course, has long passed when health authorities can concern themselves merely with the provision of pure water supplies, drains, housing, scavenging and the isolation of fever cases. Health authorities are commencing in increasing numbers to provide clinics. Ante-natal and infant welfare clinics, as well as clinics for the treatment of venereal diseases and tuberculosis, are necessary in most local authority areas. Organised publicity on health matters is regarded as essential and endeavours to acquaint the mass of the people with the opportunities offered to them must lead eventually to a general campaign of enlightenment on all matters concerning health. It must always be remembered that the individual himself or, in the case of a child, his parents can do far more to preserve health than the best of clinics, and in any case the individual must know when to consult doctors or clinics. Indeed, if there were a general knowledge of what to eat and what to avoid, of the need for adequate rest, for open air exercise, for ventilation of living, work and sleeping rooms and of what is suitable clothing and if all this advice were given in such a way that the individual would act upon it, such education in healthy living would by itself enormously improve the public health. For instance, infant welfare clinics which are provided, not for dealing with sick infants, but for keeping healthy infants well, are important factors in providing for the health education of young mothers who are such an important section of the community.

Negotiations have been opened during the year with a view to the South African Red Cross Society undertaking, in co-operation with the Department, much of this propaganda.

Lastly, the Department has to furnish and publish reports. It issues a weekly bulletin to the papers and an annual report on the activities of the Department is presented to parliament.

Although, as will be seen, the executive functions of the Department are considerable, the underlying basis of the Public Health Act and later legislation is decentralisation—health matters of local concern being dealt with by the local authorities, in many cases with financial assistance on a defined basis from the State with a strong central authority advising, assisting, co-ordinating and, where necessary in the public interests, coercing or alternatively taking over, if possible, through the agency of the Provincial Administration, and dealing with the matter at the cost of the defaulting local authority.

In public health the local authority—whether it is a municipality, village management board, health committee or divisional council—is the executive body within its area, and not the Provincial Council or the Government, the latter having the power under later legislation to take over and administer certain functions where the local authority is considered to be too weak financially to discharge its duties in this respect.

And so the local authority and not the Department is responsible for dealing with infectious and communicable diseases other than leprosy, but

the Department is required by law to make substantial refunds in respect of approved expenditure thereon. It can, moreover, step in if a local authority fails to discharge the duties assigned to it under law.

But apart from the mere offering of advice to and refunding a proportion of the approved expenditure of local authorities, one of the most important functions of the Department has been to harmonise and co-ordinate, as far as possible, in the interests of the Union as a whole the work of individual local authorities. In many matters of public health and sanitation it is essential for local authorities to act on a common basis because the effects of neglect or wrong action are rarely confined to the area primarily concerned. Infectious diseases, if left unchecked, may spread widely to other areas; the pollution of streams in one district endangers the public health of districts lower down; the lack of provision of a proper water supply at a health resort may be responsible for outbreaks of enteric fever amongst visitors from all over the Union; the absence of supervision over dairies and slaughterhouses affects the wholesomeness of the food supplies of an adjoining district; the general danger entailed to an active and progressive local authority by the existence of insanitary areas on its borders may make it necessary for such areas to be included in the district of the active and progressive local authority.

The position of the Department in these matters is one of considerable delicacy as the control of local government is vested by the South Africa Act in the provincial councils. Consequently a provincial administration can veto the capital expenditure required by a local authority to place its house in order or it may refuse to give a local authority the necessary status or power to enable it to carry out a water or other scheme of improvement considered necessary in the interests of the health of the inhabitants. The Public Health Act contains provisions enabling the Minister of Health, as a last resort, to intervene, but it is seldom in practice that this has proved necessary.

The Minister of Public Health is guided by a Council of Public Health, of which he is the chairman. The members consist of the Chief Health Officer, the Director of Veterinary Services, four medical practitioners from outside the Government service, two of whom must be specialists in public health or research work and three other persons nominated by the Minister. This body has proved extremely useful. It has provided a representative forum where questions of health policy and administration are discussed and considered before a final decision is taken and action determined on by the Minister. It ensures a detailed annual review of the activities of the Department and the public health of South Africa. The South African Medical Council acts as the advisory board on matters of policy affecting the medical, dental and nursing professions, and the South African Pharmacy Board is the advisory body in respect of pharmaceutical matters.

The Department itself, subject to ministerial control, is administered by an officer who holds, what are really, two distinct posts, namely, that of Secretary for Public Health and Chief Health Officer. On the administrative side the latter officer is assisted by a lay Under-Secretary and a clerical and administrative staff, and on the professional side by deputy chief health officers, a senior assistant health officer and assistant health officers, medical inspectors and other medical officers. The Union is divided, for departmental purposes, into three areas: The greater part of the Cape Province, is under a Deputy Chief Health Officer stationed in Capetown. Natal and a portion of the Native Territories of the Cape Province come under another Deputy Chief Health Officer stationed in Durban. The Transvaal and Orange Free State Provinces are under an officer of similar rank stationed in Pretoria.

The Deputy Chief Health Officer in Capetown is responsible to the Chief Health Officer for the health of his area and generally for the Government pathological and biological control laboratories in Capetown, the Government vaccine station and for the general supervision of the sanatorium at Nelspoort. He administers the Food and Drugs Act and is responsible generally for the proper carrying out of port health work in his area. He is the official adviser to the Cape Provincial Administration and acts as a consultant to the numerous local authorities in that Province.

The Deputy Chief Health Officer at Durban is responsible to the Chief Health Officer generally for the health of his area, for the control of port health work in Durban, for advising the Provincial Administration and local authorities and for co-ordinating the malaria campaign in the province and for directly supervising it in Natal outside local authority areas.

The Deputy Chief Health Officer in Pretoria is responsible generally to the Chief Health Officer for the health of his area; he understudies the Chief Health Officer and advises the Under-Secretary, in the absence of the Chief Health Officer. He is the official adviser on health matters of the Provincial Administrations of the Orange Free State and the Transvaal and

is available for consultation by local authorities in those provinces on technical matters. Under him is a detached Senior Assistant Health Officer stationed in Johannesburg, who undertakes the supervision on behalf of the Government of the health activities on the mines. The Deputy Chief Health Officer is responsible also for the Malaria Field Station at Tzaneen which is in charge of a malariologist.

Each deputy chief health officer has a staff of inspecting medical officers under his control for the work of the several areas. Their main functions are to keep in touch with local authority activities and to guide those local authorities which have no properly qualified health staffs of their own. In Natal, the Orange Free State and the Transvaal there are no elected rural health authorities corresponding to divisional councils in the Cape and in these areas the magistrates of the several districts are *ex-officio* the rural health authorities.

Slum Elimination and Rehousing.—At headquarters is the Central Housing Board which advises and assists local authorities in the great work of slum elimination and rehousing displaced populations and in the provision of additional housing accommodation generally.

It may be mentioned in passing that it was recently suggested by the Continuation Committee of the Poor White Conference without apparently taking any evidence on the subject that slum elimination and rehousing should be a function of a proposed new department of social welfare.

In no other country in the world hitherto has it been seriously suggested by a responsible body that slum elimination and housing should, centrally or locally, be divorced from public health administration.

The scheme of public health administration adopted in South Africa as has already been shown is founded upon the local authority being the executive authority with the Ministry of Health as the supervisory authority. The protection of the public health is, therefore, under the Public Health Act, the duty of the local authority, while the widest powers are given to the Minister to ensure that a local authority does its duty.

Local authorities are required to appoint medical officers of health and sanitary inspectors to administer the Act locally. The Ministry contributes to the funds of the local authority a proportion of their salaries, subject to satisfactory certification by the Chief Health Officer. The appointment of the medical officers of health and the dismissal of these officers, sanitary inspectors, health visitors and similar officers, are subject to the approval of the Minister.

The personnel of the Central Housing Board consists of the chairman, who is the chief clerk in charge of the general branch of the Department, an *ex* town engineer, an architect, a lawyer and a health officer acquainted with the area in which any inquiry is being held.

The Board has no administrative functions whatever and in the last resource when a local authority fails to do its duty all administrative action must depend upon action taken by the Chief Health Officer under section 11 of the Public Health Act.

The whole question of slum eradication and rehousing is intimately bound up with many other health problems, notably the reduction in infant mortality and the prevention and control of tuberculosis.

In regard to tuberculosis control, the Department aims at ensuring that preference will be given in rehousing schemes to the families of tuberculosis patients in such a way that without segregating such families in special areas they can be grouped within easy access for purposes of home visitation.

Obviously rehousing and slum elimination in urban areas must go hand in hand. I have endeavoured to show that the working of the machinery and the supervision of the machine are essentially public health functions and I do not think that the removal of these subjects from the Health Department could do otherwise than gravely slow up the movement which is now daily gathering impetus as a result of the continuous crusade that has been waged by the Department.

It must be remembered that local authorities have in some instances had to be dragooned under the Public Health Act into doing their duty and the taking over of supervision by another department would quickly enable such local authorities as desired to do so to seize an avenue of escape from undertaking commitments.

To secure good health administration all health functions should be concentrated locally in the hands of one local authority and centrally in the hands of one Ministry.

This ideal is not possible so long as the provincial councils last and thus we have in South Africa semi-autonomous local authorities, hospital boards, cemetery authorities, etc., etc., functioning side by side and the Department

as the main central health supervisory authority having to function in certain instances through the provincial administrations, which in itself makes for delay and some inefficiency.

To remove housing and slum elimination to another department would simply mean the creation of another central authority which, unless given legislative powers of its own, would have to depend from beginning to end upon the powers vested in the Department of Public Health.

Local authorities are substantially subsidised by the Department in the carrying out of certain health functions and the subsidy is payable, subject to certification by the Chief Health Officer that the work has been satisfactorily done.

The Ministry is specifically charged under section 131 of the Public Health Act with the duty of collecting information in regard to overcrowding or bad or insufficient housing, and of inquiring into the best methods of dealing with the position. Further, every medical officer of health has to furnish to the Chief Health Officer an annual report on the conditions in his area. Under section 6 of the Act the local authority may be required to send to the Department a copy of every important report submitted by the medical officer of health, engineer or sanitary inspector on any matter relating to health.

By means of inspections of local authority areas by assistant health officers and by the reports of the medical officers of health, the Department is thus able to be in close touch with the activities of local authorities and to keep backward local health administration up to the mark by its criticism which is usually published in the local press or by the publication of details in its annual report or by threat of withholding subsidies.

Finally, machinery is provided by section 11 of the Act for forcing a local authority, which has failed or refused to exercise its powers under the Act, to take such action as the Department may consider essential.

It will be seen, therefore, that the Public Health Act in South Africa—as in other countries—places housing conditions as of fundamental importance in the protection of the health of the people. They are indeed with the provision of proper food and water supplies the very foundation of preventive medicine upon which the prevention of disease and physical ill-health depend.

It would now be well to consider the Slums Act. Here again the initiation of measures depends on the local medical officer of health. He must report to the local authority that in his opinion a nuisance exists and thereupon the local authority *must* take the action prescribed by the Act which lays upon the local authority the duty of remedying nuisances and of ensuring the provision of housing generally.

The keeping of local health administrations up to the mark and of ensuring that local authorities do not shirk their responsibilities are again the duties of the Department which in the last resource can take action under section 11 of the Public Health Act.

The functions of the Central Housing Board are to advise the Minister, the Administrator and local authorities. It has had certain powers of hearing appeals under the Act delegated to it. It is an essential part of the machinery of Government and is correctly placed in the Department of Health where it has access to all reports in the possession of the Department.

The removal of slums and the rehousing of displaced populations with the allied problem of tuberculosis, constitute perhaps the most important work on which the Department is at present engaged.

There is a widely prevalent idea that the way to deal with the slum problem is to pull down the existing slums. A more mistaken and dangerous idea it would be difficult to find. Under the conditions of overcrowding that have existed in every slum in our large towns since the end of the war, any pulling down of slum houses has done nothing but harm unless the displaced occupants have been suitably rehoused. It has simply intensified the already appalling overcrowding in other homes and helped to create new and worse slums. A solution of the slum problem is only possible when alternative accommodation is available at rents which the slum dweller can pay and in positions where he has access to his work without excessive expense.

It has often been argued that the slum can never be abolished because it is the slum dweller who makes the slum. Those who hold this depressing theory believe that quite a considerable proportion of those who now live under bad and dirty conditions are under no circumstances capable of bringing up their families decently. If this pessimistic theory were true, the slum problem would be insoluble, but experience in South Africa and overseas has shown that the theory is definitely untrue. Undoubtedly, there are those who will turn a new house into a self-contained slum, but all our

evidence goes to show, as against the pessimist who asserts that the pig makes the sty, that the proportion of those who do not respond to their environment is very small indeed.

The Department then is fostering through the local authorities the rehousing of the people who cannot otherwise provide for their own housing needs and the elimination of slums on a scale that will, we hope, cause a revolution as it has done overseas in the general health of our urban communities.

These rehousing projects are of two kinds, namely, those which are economic and those which are sub-economic in character.

Economic housing projects are those in which the Government lends money through the provincial administrations to local authorities at an economic rate of interest which at present is 3½ per cent. A local authority receiving such a loan then either lends the money received to individuals desiring to build houses for themselves up to a maximum of 80 per cent. of the value of the houses and grounds, recovering the same in annual instalments of interest and sinking fund charges or it may build the houses itself and either sell the houses when erected on a hire purchase system or let such houses to suitable tenants. Up to 30th June, 1937, 14,991 houses, including 28 hostels, barracks or compounds had been approved by the Central Housing Board representing economic loans advanced to local authorities amounting to £4,898,302. With the coming into full operation of Act No. 41 of 1937, it will also be possible for the State to assist in economic housing through the agency of building societies.

Approved building societies are empowered to enter into a contract with the Minister under which they can obtain moneys voted for the purpose of advancing loans to suitable applicants up to 90 per cent. of the value of the houses and ground. Every such loan will be divided into two parts: two-thirds being made from the ordinary funds of the society and carrying interest charges at the normal rates made by the society and one-third which will be made from Government funds carrying interest at 3½ per cent. On the 30th June last the question of a standard form of contract was still under discussion with the legal advisers of the Government. It is not thought probable that very many loans will be asked for under this scheme which is not so attractive to the man of small means as an economic loan obtained through a local authority under the Housing Act. It is thought, however, that the Additional Housing Act will, at any rate, prove useful to persons with incomes slightly in excess of the incomes of individuals who are usually assisted by local authorities as well as in areas where for one reason or another local authorities have failed to assist in the provision of economic housing.

It has been found, however, that, owing to the low wages paid to many people, they are unable to pay for housing at economic rates and so the Government set aside in 1936 the sum of five millions for subeconomic Government set aside in 1936 the sum of five million pounds for subeconomic housing.

This is advanced to local authorities for letting schemes at ¾ per cent. interest, i.e. the Government loses on every £1,000 remaining outstanding approximately £25 per annum in interest. This may be regarded as a State subsidy for the housing of the poor. But in order that the local authority shall also make some contribution, it is laid down that the local authority in fixing the rentals shall aim at losing exactly one-half of the amount contributed by the Government, so that for every £1,000 owing to the Government the local authority must lose £12. 10s. per annum. But the local authority is allowed to charge *inter alia*, in its rents the equivalent of the rate levied in the area so that for every 1d. it levies as a rate it receives for every £1,000 in value of the new houses £4. 3s. 4d. by way of rates. It will thus be seen that in the ordinary municipality where a three-penny rate at the very least is levied, the amount received in lieu of rates on new houses under the scheme is the equivalent of the local authority's loss.

The scheme on its present basis has only been in operation since the 1st October, 1936. It has met with a splendid response from local authorities and already schemes have been approved or money has been provisionally allocated for schemes in course of preparation in excess of the initial five million pounds authorised. The response has been so excellent that authority to commit the Government to a further five million pounds, making ten million in all, has been obtained. Much of this money is being spent on providing proper accommodation for non-Europeans.

Then we have the scheme for housing the aged poor and totally unfit. Under this scheme the Government advances money to local authorities with interest charges at one-shilling per cent. for the purpose of erecting houses or hostels for this class. All that is required of the local authority is that it shall make itself responsible for the repayment of the interest and capital charges over a period of 40 years. It is able to do this by charging merely nominal rents which are within the means of the old people or other persons who are often in receipt of pensions or grants from charitable bodies.

I believe, if the Government is able to continue to make sufficient money available, that within five years the Department will be able to ensure that the slum populations have been rehoused and that the slums have been entirely eliminated from our large cities and that, moreover, it will have gone some way in the same direction in our smaller areas. The total cost of this work will certainly not be less than thirteen million pounds but should not be more than fifteen million.

It is expected that these rehousing schemes in our urban areas will definitely facilitate the attack which is being made on tuberculosis.

The Tuberculosis Campaign.—It will be remembered that at a meeting in January, 1934, the Council of Public Health passed the following resolution:—

> "This Council views with alarm the incidence of tuberculosis in the Union among Europeans and Coloured people and the unsatisfactory and inadequate manner in which the problem, except at a few centres, is being dealt with at present as disclosed by the annual report of the Public Health Department. The Council realises that drastic steps are necessary to cope with the present position and believes that the time is now opportune to enlist the sympathy of local authorities and the public generally with a view to the betterment of the housing conditions of the poorer classes and the provision of more adequate facilities for the care of those suffering from the disease. The Council is satisfied that the aims of the Public Health Department to secure a national scheme for dealing with tuberculosis embracing—
>
> (1) tuberculosis clinics in all the larger centres subsidised under the Public Health Act;
>
> (2) the enlargement of the existing sanatorium so as to serve the whole Union for the care and treatment of early cases; and
>
> (3) provision for the hospitalisation of advanced cases in each of the four provinces,
>
> are worthy of the earnest consideration of the Government and recommends accordingly."

As a result of this resolution the Government committed itself to undertake a nation-wide campaign against the disease and during the last four years the Department and local authorities have been steadily perfecting arrangements with this end in view.

In 1938, when most of the new tuberculosis hospitals and clinics will be approaching completion, it is proposed to convene a tuberculosis conference under the auspices of the Department with the object of speeding up the campaign for dealing with the disease.

Full particulars of the progress made during the year in providing additional bed accommodation in hospital for sufferers from tuberculosis are given in a later section of the report. Additional accommodation for sufferers from tuberculosis will (as the Medical Officer of Health for Capetown recently pointed out) have to be provided in the Cape Peninsula for the Coloured community. Another gap is at East London where approximately 50 beds for non-Europeans are still required.

There seems a reasonable prospect that a system of births and deaths registration for non-Europeans in rural areas may be introduced shortly. This will greatly facilitate the campaign. The extent to which tuberculosis is rife in the rural populations is not known with any degree of certainty at present but sufficient is known to make it clear that the position has substantially altered for the worse in recent years in the large Native reserves and locations. When Dr. Peter Allan made a survey in the Native areas some eight or nine years ago, he found that the disease was already endemic and widespread and that Natives returning from urban areas with tuberculosis were adding infection to the pool.

The position has been materially aggravated by years of financial depression in the territories which coincided with years of drought and much malnutrition and loss of resistance to disease amongst the Native peoples.

In the last annual report it was mentioned that Dr. Westlake Wood, the District Surgeon at Bizana, examined 2,252 school children in his district and found that 4·5 per cent. of the children were suffering from tuberculosis and that 3·9 per cent. of all children examined were pulmonary cases of the disease.

The Council of Public Health at its last meeting decided that it was desirable to obtain similar information in respect of further representative

districts in the Native Territories in order to confirm or correct the view that the Bizana survey may be regarded as generally applicable to the whole of the territories. The districts of Umtata, Tsolo, Willowvale, Mount Fletcher and Engcobo have been selected and the Treasury has authorised the allocation of funds to enable this survey to be carried out during the present year. Further it is hoped to post Dr. Dormer, the Medical Superintendent of Nelspoort, on his return from overseas, to carry out a tuberculosis survey in the Native reserves and locations in Natal and Zululand, pending the opening of the King George V Hospital for Tuberculosis in Durban.

Towards the end of 1938, therefore, the Department hopes that it will have much more detailed information at its disposal than it has to-day as to the prevalence of the disease in the rural non-European population. A large number of additional beds in hospitals will be available for dealing with the disease. It is hoped that at least every large centre where the disease is prevalent will have properly organised tuberculosis clinics and that co-ordinated follow-up systems will everywhere be in operation. The Public Health Act has already been amended so as to place the expenditure on tuberculosis to the extent of one-half on the Union Government, one-quarter on the provinces and one-quarter on the local authority. It has further been amended so as to enable the Minister, on the certificate of a medical practitioner, to ensure that any patient urgently in need of treatment may be given such treatment where a local authority has failed so to do. It still, in my opinion, requires further amendment so as to remove the limitation of £10,000 as the maximum refund that may be paid by the Department on other than capital schemes in any one financial year to a local authority. At present the only local authorities that this affects are Capetown, Johannesburg and Durban.

Further, a nutritional survey of children in the different districts of the Union is to be carried out on a uniform basis by the Department in co-operation with the provincial school medical inspectorates. From the results of this survey much valuable data for the campaign against tuberculosis should become available.

The income from the King George V Silver Jubilee Fund for Tuberculosis is utilised for the relief of dependents while the breadwinner is in hospital with tuberculosis and the fund is proving a boon to the public in this respect. It has also provided relief to a limited extent to sufferers immediately after discharge from hospital. This has been possible owing to the fact that the demands on the fund for dependents will not fully absorb its income until the additional hospital beds projected are available. When this occurs it would seem almost certain that the income of the fund amounting to about £3,500 per annum will be insufficient to meet all the claims likely to be brought forward.

For many months past the Department has represented to the Government very strongly the need that exists for many sufferers from tuberculosis being financially assisted by the State during the periods when they are unfit for work and are either awaiting removal to an institution for treatment or, after being treated, are not yet sufficiently well to return to their employment. In the past many patients who have made a good recovery in the sanatorium or a hospital have again broken down in health by returning to work prematurely, with the result that they have had to be again returned to an institution for further treatment. The Department of Social Welfare has now accepted the recommendation in principle in the case of needy European and Coloured Tuberculotics and these persons will shortly be placed in the same position as the permanently unfit during periods of unfitness when they are awaiting institutional treatment or during convalescence after discharge from hospital. The Department has taken up the question of a similar scheme for natives with the Department of Native Affairs.

At the conference of tuberculosis workers above referred to, which is to be convened in 1938, it is hoped to be able to ensure the adoption of measures aiming at the prevention of overlapping and the co-ordination of effort in a sustained attack which is to be made on the disease. The question will also be discussed as to what additional measures are necessary particularly amongst the inhabitants of the Native reserves and locations. If the disease in these areas is found to be as prevalent as is believed it will obviously be impracticable to undertake treatment on any large scale by hospitalisation.

The only practicable method of treatment in such areas in the great majority of cases must of necessity be based upon schemes of modified isolation in their homes.

The main advances in public health administration during the last six years.

In view of the actual retirement or approaching retirement under the age limit of every health officer in the service of the State who was appointed in that capacity prior to 1926 it would not be inappropriate to place on

record the main advances in public health administration that have been achieved during the last six years. These may be briefly summarised as follows:—

(1) Malaria in Natal and Zululand has been definitely brought under control at a very low cost in all areas where community measures are possible. In the Transvaal, where community measures are not generally possible, considerable headway has been made in educating the population in protective measures.

(2) A very considerable extension of the district surgeons' system has taken place with the object of securing a better medical service for the rural areas of the Union. The emoluments of district surgeons have been improved and brought more into line with the services rendered.

(3) A successful district nursing service has been inaugurated.

(4) A woman medical officer, with three inspectors of nursing has been appointed to deal with problems connected with maternal and infant welfare.

(5) A control laboratory has been established for the assay of therapeutic substances.

(6) A campaign for the elimination of slums and the rehousing of displaced populations has been successfully launched and extensive schemes are—almost in every town where needed—being commenced or are actually being carried out.

(7) Local authorities along the Reef and in certain other towns have been induced by the exercise of departmental pressure to appoint whole-time medical officers of health.

(8) A national campaign against tuberculosis has been launched which includes the provision of hospital facilities, the establishment of clinics and follow-up systems, the relief of dependents of needy patients in institutions, and financial assistance to needy patients during periods of unfitness for work while not in institutions. It includes also a survey of tuberculous children in the Native reserves and locations and a nutritional survey of the population.

(9) *The Amendment of the Law relating to Tuberculosis.*—A local authority no longer has to pay one-half of the cost of dealing with cases of tuberculosis. It now only has to pay one-quarter of such expenditure and it can be relieved even of that if the Minister, after consultation with the responsible Provincial Executive, decides that it cannot properly bear the burden.

The law has recently been altered also so as to provide that when a local authority refuses or fails to deal with a patient, the Minister may, on receipt of a medical certificate to the effect that the patient urgently requires treatment, step in over the head of the local authority and cause such treatment to be provided and recover the share of the expenditure, that would have been normally borne by the local authority in default, from that local authority.

(10) The extension of venereal diseases clinics.

(11) The arranging of the two Pan African Health conferences held in South Africa in 1932 and 1935.

Advances in Public Health Administration Approved but not yet in Operation.

Amongst these the most important are the following:—

(1) *The Appointment of a Dental Health Officer.*—It will be the duty of this officer, when appointed, to endeavour, in conjunction with the several branches of the Dental Association of South Africa and in collaboration with the Dental School of the University of the Witwatersrand, to carry out a field research into the distribution and causation of dental caries in the different districts of the Union, with a view to determining what measures can be taken to lessen the prevalence of this disease. It is hoped that the officer appointed may later be in a position to build up a dental health unit for the purpose of co-ordinating the various dental schemes now in operation, with the object of providing a proper dental service for the nation.

(2) *The Appointment of an Ecologist to Study the Fleas of the plague-carrying Rodents in South Africa.*—It is hoped that as a result of this research which should make available certain facts on which no exact information is at present known, it may be found possible to improve the measures advocated for dealing with rodent plague in the rural areas of South Africa.

Advances in Public Health Administration still under consideration.

These may be briefly summarised as follows:—

(1) At the present time we have very little information of births and deaths in the rural areas amongst non-Europeans and, the Government, as a result of persistent agitation by the Department over many years, set up last year an interdepartmental committee to investigate the best method of introducing a system of births and deaths registration amongst non-Europeans for rural areas. The committee has presented a unanimous report to the Government which it is sincerely hoped will be adopted and its recommendations given effect to. Without proper vital statistics any national campaign against disease would, of course, have to be conducted with the same disabilities as a general in command of troops in a war would experience if he had not the aid of a reliable intelligence service. It is absolutely necessary for the department to have reliable statistics if any real headway is to be made in the fight against disease.

(2) The adoption of a scheme of national health insurance, such as that recently recommended by the departmental committee of inquiry, is one which would make an enormous improvement in the public health of South Africa. It is proposed, broadly, that a scheme of compulsory insurance should be established against the risk of sickness for the benefit of all employed persons (including dependents) of either sex and of all races who are resident in the areas of urban local authorities and are earning not more than £400 per annum.

The following benefits are suggested:—

(*a*) General medical practitioner service including free drugs, medicines and curative appliances.

(*b*) Specialists' services.

(*c*) A payment towards the cost of hospital treatment of those employed persons and their dependents who would in present circumstances be required by provincial hospital boards to make some payment towards the cost.

(*d*) A payment of a lump sum on confinement of an employed woman or the wife of an employed man.

(*e*) A payment of a lump sum for the cost of burial of an employed person or his or her dependents.

(*f*) A cash payment during periods of sickness.

In regard to the last-mentioned benefit the committee of inquiry was dubious as to its practicability in view of the difficulty of control in the case of insured persons living in the areas of the smaller local authorities and consequently computed the cost of schemes to include and exclude the benefit. This difficulty would not be great, however, in the areas of municipalities and if the scheme was confined at first to such areas sick pay should certainly be included in any Bill. It is obvious that the provision of a medical service will lose at least half its value if insured people are unable, owing to cessation of income, to comply with the doctor's instruction to cease work during periods of sickness; the provision in the scheme for a reasonable cash payment during sickness will enable full advantage to be derived from the medical benefit.

The funds required for the provision and administration of these benefits will be derived from contributions by the Government, employers and employed people in the proportion approximately of Government 14½ per cent., employers 49 per cent. and employees 36½ per cent.

According to the calculations of the Government actuaries, the total annual cost of providing these benefits, including all expenses of the administration thereof, if extended to all employed people and their dependents in the areas of all urban local authorities, would be £5,331,691 which would be found by Government to the extent of £776,735, employers to the extent of £2,663,315 and employees to the extent of £1,891,641. The expenses of administration were computed at 10 per cent. of the cost of benefits. If only employed people in municipalities were to be brought under the scheme the cost would be considerably less.

The departmental committee proposes that the management of the scheme should be vested in a Central Board of Management composed of an equal number of representatives of the Government, the employers and employees, one of the Government's representatives to be a member of the medical profession. The Central Board will establish as many district boards as it considers necessary for the proper carrying out of the scheme under the supervision of the Central Board.

The provision of medical services and the supply of drugs, medicines and curative appliances would be arranged by the Central Board with the South African Medical Association and with the Associated Pharmaceutical Societies of South Africa, respectively. All contributions would be paid into a fund to be called the Health Insurance Fund and from this fund will be met all expenditure. The fund is intended to be under the control and management of the Central Board which would furnish the Minister with such periodical statements and reports as he may require. It is proposed that the fund should be audited by the Controller and Auditor-General and that there should be periodical actuarial valuations.

It is to be sincerely hoped in the interests of public health that the scheme will be adopted in principle by parliament. Such a scheme would be an investment for the nation which would return dividends in shape of better health for its citizens.

(3) *The Adoption of a National Scheme of Physical Education and Training.*

During the year there has been a demand made by various interested bodies for the adoption in South Africa of a national scheme of physical education and training.

There can be no question but that a national scheme of physical and health education is desirable in the interests of the nation but the matter is not one that can be lightly entered into without the fullest inquiry. The effects of physical education on the human body are multifarious. It influences both physical form and organic functions and its effects vary with climate and according to the age, sex, physical condition, state of training and general conditions of life, especially nutrition of the individual. In every country a large proportion of the population is unequal to the normal exercises of collective physical culture or athletic training. In South Africa a considerable proportion of unfitness is undoubtedly due to malnutrition and special attention will have to be given to this. As a commission of experts of the Health Committee of the League of Nations has pointed out it is essential to investigate the genesis and the treatment of this widespread physical unfitness. Further it is emphasised that special measures will have to be devised and applied to individuals suffering from constitutional defects.

There can be no question but that it would do infinite harm to train, as has been suggested, drill instructors of the army type for distribution amongst the schools and civilian population for they would not be dealing in the mass with people who are all properly fed and up to standards required for military service.

Further the relations between intellectual work and development on the one hand and athletic training on the other have been insufficiently studied and the minimum daily or periodical amount of physical culture desirable to keep individuals in normal health at all ages has to be further scientifically investigated. We simply do not know the maximum amount of physical culture and activity consistent with hard intellectual work.

A commission of British experts recently visited Germany and in its report observed " that physical education in itself is an excellent thing nobody can deny, but its continued prosecution to excess at the expense of things of the mind and soul in a whole nation might lead to fearful consequences for her and trouble for the whole world ".

The commission indeed raises the whole question as to whether there is not already a tendency in certain countries to seek to develop the body at the expense of the mind and to regard it as a mere machine to be kept constantly tuned up to the highest possible pitch of efficiency rather than the habitation of the mind and the temple of the soul.

The methods to be adopted must be physically, psychologically and intellectually harmless and they must be such as not to train champions but to develop the physical fitness of the masses on rational lines.

The subject has been referred by the Government to an inter-departmental committee for investigation and report.

(4) *The amendment of the present law restricting the refunding to a local authority of not more than* £10,000 *in any one year under the Public Health Act.*

There can, I think, be no doubt but that section 134 *bis* of Act No. 36 of 1919 which was inserted by section 3 of Act No. 29 of 1933 has resulted in some of the larger local authorities hesitating to proceed with schemes which are necessary for the protection of the public health. The section in question was inserted in the Act after a period of grave financial depression and if the Department is to make a success of its campaign for better health, it will be necessary for the larger local authorities to be accorded more generous treatment by the Government than is given by the law as it stands at present.

During the year the Department brought forward officially a proposal that the law should be amended so as to provide the following refunds to local authorities under the Public Health Act:

(*a*) As prescribed at present in the Act up to £10,000.

(*b*) Where the annual refundable expenditure without any restriction would be from £10,000 to £15,000, £10,000 plus three-quarters of the balance.

(*c*) Where the refunable expenditure without any restriction would be from £15,000 to £20,000, £10,000 plus three-quarters of £5,000, plus one-half of the balance over £15,000.

(*d*) Where the refundable expenditure without any restriction would be £20,000 or over, £10,000 plus three-quarters of £5,000 plus one-half of £5,000 plus one-quarter of the balance over £20,000.

These proposals are at present receiving the consideration of the Government.

II.—VITAL STATISTICS.

1. *Population.*—The total population of the Union at 30th June, 1936, as estimated by the Director of Census was 9,617,200, consisting of 2,008,700 Europeans and 7,608,500 non-Europeans. The non-European population may be further divided up into 6,617,700 Bantu, 220,400 Asiatic and 770,400 Mixed and other Coloured.

2. *European Vital Statistics.*—The salient features of the European population for the last seventeen years are summarised in Table A (i).

TABLE A (i).—UNION OF SOUTH AFRICA: SUMMARY OF VITAL STATISTICS OF EUROPEAN POPULATION, 1920-1936.

Calendar Year.	European Population (estimated).	Birth Rate per 1,000 of Population.	Death Rate per 1,000 of Population.		Death Rate per 100,000 of Population from				Percentage of Total Deaths, the Cause of which was Medically Certified.	Infantile Mortality Rate (Deaths of Infants under One Year per 1,000 Live Births Registered).	Maternal Mortality Rate (Deaths of Mothers in connection with Pregnancy or Childbirth per 1,000 Live Births Registered).	Survival Rate or Rate of Natural Increase (Excess of Births over Deaths per 1,000 of Population).
			Actual or Crude.	Standardized.*	Diseases of Heart and Circulatory System.	Pneumonia and Bronchitis.	Cancer.	Tuberculosis (all forms).§				
1920.....	1,499,911	28·97	11·09	12·15	95·67†	113·87†	58·94†	46·00†	79·78	90·07	4·10†	17·88
1921.....	1,519,488‡	28·44	10·41	11·43	102·91	136·15	69·09	58·26	80·76	77·09	4·94	18·03
1922.....	1,556,241	27·52	9·48	10·41	97·99	127·24	70·88	47·74	82·96	72·91	5·21	18·04
1923.....	1,579,733	26·70	9·77	10·65	108·50	120·72	78·94	46·46	82·77	74·42	5·22	16·93
1924.....	1,610,774	26·29	9·62	10·44	123·92	123·79	76·36	51·59	84·74	73·73	4·75	16·67
1925.....	1,637,472	26·51	9·39	10·15	128·86	97·04	72·86	52·70	86·45	68·39	5·62	17·12
1926.....	1,676,660‡	26·16	9·59	10·28	127·21	113·44	71·18	53·41	87·76	64·82	4·56	16·57
1927.....	1,708,955	25·95	9·73	10·34	122·76	110·42	73·20	50·50	89·93	70·62	4·80	16·22
1928.....	1,738,937	25·77	10·15	10·69	133·53	127·72	77·52	50·95	89·93	70·49	4·98	15·62
1929.....	1,767,719	26·15	9·51	9.98	127·11	104·04	77·44	45·37	90·19	64·22	5·26	16·64
1930.....	1,797,900	26·44	9·69	10·08	132·33	112·87	82·62	46·76	91·15	66·84	5·26	16·75
1931.....	1,829,300	25·38	9·37	9·56	131·53	103·75	85·55	44·22	90·46	63·07	4·70	16·01
1932.....	1,859,400	24·17	9·97	9·98	137·52	113·75	89·06	42.33	90·84	68·57	5·31	14·20
1933.....	1,890,300	23·55	9·35	9·27	142·52	100·30	95·33	40·68	91·45	61·01	4·81	14·20
1934.....	1,914,700	23·44	9·68	9·55	156·21	94.53	92·39	39·54	91·91	60·79	5·99	13·76
1935.....	1,973,700	24·18	10·45	10·28	169·58	131·98	95·76	40·44	92·55	62·81	4·73	13·72
1936.....	2,008,700	24·21	9·57	9·54	154·38	106·19	97·28	34·40	92·88	59·06	5·10	14·64

* The rate which would have obtained had the age and sex distribution of the population been the same as that of England and Wales at the 1901 census, the standard usually taken for international comparisons.

† Medically certified deaths only. Rates for subsequent years calculated on total deaths registered.

‡ Actual (per census).

§ Includes Miners' Phthisis combined with Pulmonary Tuberculosis.

Populations may increase as the result of migration—excess of immigration over emigration—and of survival—excess of births over deaths. In the Union, migration is having a negligible effect. Natural increase, or the excess of births over deaths is still, however, strikingly high, although it has shown a steady fall during the past twenty-six years as is revealed by Table A (ii). This fall is very largely due to the declining birth-rate. The European death-rate, although the tendency has been on the whole downwards, will be seen from the table not to have improved to any considerable extent.

TABLE A (ii).—SURVIVAL RATE OR RATE OF NATURAL INCREASE AMONG EUROPEANS IN THE UNION, PER 1,000 OF THE POPULATION.

Year.	Birth-rate.	Death-rate.	Natural Increase.
1911	32·2	10·4	21·8
1912	32·2	10·3	21·9
1913	31·7	10·3	21·4
1914	30·2	9·5	20·7
1915	29·3	10·3	19·0
1916	29·3	10·2	19·1
1917	29·0	10·3	18·7
1918	28·6	17·2	11·4
1919	26·9	11·9	15·0
1920	29·0	11·1	17·9
1921	28·4	10·4	18·0
1922	27·5	9·5	18·0
1923	26·7	9·8	16·9
1924	26·3	9·6	16·7
1925	26·5	9·4	17·1
1926	26·2	9·6	16·6
1927	25·9	9·7	16·2
1928	25·8	10·2	15·6
1929	26·1	9·5	16·6
1930	26·4	9·7	16·7
1931	25·4	9·4	16·0
1932	24·2	10·0	14·2
1933	23·5	9·3	14·2
1934	23·4	9·7	13·7
1935	24·2	10·5	13·7
1936	24·2	9·6	14·6

The natural increase rate amongst our European population is exceeded by that of only one other country in which vital statistics are recorded, namely, Egypt, in which the rate is 17·6. For convenience of comparison with other dominions and certain Western European countries Table A (iii) is inserted.

TABLE A (iii).—COMPARISON OF BIRTH, DEATH AND NATURAL INCREASE RATES AMONG EUROPEANS IN THE UNION WITH OTHER COUNTRIES. AVERAGE RATES FOR THREE-YEARLY PERIODS.

	Birth-rate.	Death-rate.	Natural Increase.
Union of South Africa	24·0	9·9	14·1
Holland	20·3	8·6	11·7
Portugal	28·3	16·7	11·6
Canada	20·5	9·5	11·0
Italy	23·0	13·6	9·4
New Zealand	16·4	8·3	8·1
Australia	16·7	9·4	7·3
United States of America	16·9	10·8	6·1
Germany	18·6	11·5	7·1
England and Wales	14·8	11·9	2·9
France	15·9	15·5	0·4

The situation revealed by the fertility and mortality rates of most Western European populations is disturbing. Their present natural increase is not indicative of a continuance of population growth, as the low birth and death rates are leading to a steadily increasing average age constitution, from which inevitably follows a decreasing reproductive capacity. Unless conditions are changed, it seems that most of these populations must face the threat of ultimate extinction.

The high natural increase rate in the Union is due to our relatively high birth-rate. Although the European birth-rate has fallen from 32·2 in 1911 to 24·2 in 1936, it is still as seen from Table A (iii) amongst the highest in the world. The rate for 1936 is the same as that for 1935 which was higher than that of the previous two years. This improvement will probably be

only of a temporary nature attributable to the passing of the financial depression which had unduly accelerated the decline.

Though the crude death-rate has changed but little during the past fifteen years, a slight downward tendency is evident from the figures shown in Table A (ii). The infantile mortality rate, however, which is generally accepted as giving a fair indication of the sanitary development of a country shows on the whole a satisfactory decline, from 90·1 in 1920 to 59·5 in 1936. But our European figures which are almost certainly very much better than those of the Bantu compare none too favourably with those of certain other countries as will be seen from Table A (iv).

TABLE A (iv).—INFANTILE MORTALITY RATES: EUROPEANS IN THE UNION COMPARED WITH OTHER COUNTRIES. AVERAGE RATES FOR THREE-YEARLY PERIODS.

New Zealand	32
Australia	42
Holland	41
England and Wales	58
Union of South Africa	61
Canada	72
France	71
Germany	67
Belgium	84
Italy	100
Lithuania	139
Portugal	147

3. *Non-European Vital Statistics.*—Statistical information regarding the non-European population of the Union cannot yet be compiled owing to the absence of the necessary data. Under the Births, Marriages and Deaths Registration Act (Act No. 17 of 1923) registration of non-European births and deaths is compulsory only in urban areas, and in many of these, owing to the large proportion of non-European male adults temporarily resident as labourers and to other circumstances, computations of death-rates and similar statistics are useless and misleading. Registration in rural areas is not provided for except on voluntary application. The voluntary registration granted by the Act has met with little response, as it is only Natives of the teacher and clergyman class who desire birth certificates for their children. The demand for such registration shows little likelihood of increasing; its statistical value is negligible.

The Act does, however, visualize the extension of vital registration to rural Natives. In any such areas registration can be provided for merely by Governor-General's proclamation in the *Gazette*.

This Department has repeatedly urged the necessity in the interests of public health administration of an improved registration system. Control of the factors affecting the health of a community depends upon knowledge of the extent to which disease and defects are operating. We do not know to what extent such factors as malnutrition, tuberculosis, typhus, typhoid, malaria and venereal diseases are producing disease and death among the Natives. This lack of knowledge has a serious crippling effect on all the efforts of health authorities to protect the well-being not only of the non-European, but also the European sections of the community.

It is an accepted principle of public health practice that progress and efficiency are dependent upon the accuracy of statistics concerning births, deaths and disease. The science of vital statistics represents the book-keeping system of a public health administration and is as essential as book-keeping is to a business.

These urgent requirements of the Department have at long last been appreciated to this extent that an inter-departmental committee was appointed as the result of a resolution passed by the Council of Public Health in January. This resolution stated:—

> "This Council views with concern the lack of vital statistics in so far as the non-European population is concerned, and urges the Minister of the Interior to submit the matter of the great need for the registration of births and deaths of the non-European population to the Statistical Council which advises the Minister on all matters relating to statistics."

The committee appointed consisted of representatives of the Departments of Public Health, Justice, Native Affairs and the Interior. In an admirable report this committee pointed out that amongst the larger social problems facing many countries throughout the world to-day is that of population. Those countries with European populations have recently been awakened to the urgency of obtaining more knowledge by the results of the analysis of population growth and decline made possible by Kuczynski's new indices. These have revealed that European populations are faced with declining

numbers at a rate so rapid that unless circumstances materially change, their extinction is not beyond the bounds of possibility.

In South Africa we are gathering information sufficiently clear to indicate that our European populations are also entering this same phase of decline, but in regard to our Native populations we are completely in the dark. We can only guess as to whether these non-European populations are likely to increase largely or not. An answer to this question, especially in view of the numerous aspects of our South African civilisation which hinge on the ratio of European to non-European, must be admitted to be of fundamental importance. Scarcely any feature of the national life, of the country's plans and programmes for the future in statesmanship, defence, industry, mining, agriculture and commerce, is unaffected by the numerical relationship of the two races, black and white. Knowledge is therefore required urgently for these larger social purposes as well as for the health needs discussed above.

The committee agreed that there could be no question as to the need for instituting a system of vital registration for the Native races. This system, in view of the fact that the populations as a whole are providing the problems, should cover the whole Union. Partial registration would be of very limited value. The machinery set up under the 1923 Act consisted of a Registrar-General for the whole Union, a registrar for each of the four provinces, and district registrars for each magisterial district; where not specially appointed, magistrates are *ex officio* registrars for their respective districts. In some districts there are one or more assistant district registrars, who are usually recruited from the ranks of minor Government officials, such as clerks or postmasters. These officers are remunerated on a system of a fee per form completed. Additional assistance is obtained through the police and special justices of the peace. The various forms completed by the district registrars are forwarded to the central office in Pretoria, and are then passed to the Office of Census and Statistics for statistical treatment. This analysis depends upon a system of coding, mechanical sorting and tabulation.

The committee points out that the present organisation of the State is such that Government services of one form or another have extended to all parts of the Union, while an organisation for vital registration for Europeans in rural areas exists on a district or magisterial basis throughout the country. It considers that the existing organisation enables a system for Natives in non-urban areas to be instituted, and that the system should be based on an extension of the present machinery rather than on the elaboration of special means.

The size of the country and the primitive social conditions of the bulk of the Native peoples admittedly place difficulties in the way of securing an immediate, complete and accurate record of all births and deaths. Nevertheless it is believed that the system would be initiated on a more solid foundation and with better prospects of success than existed when many of the present efficient European procedures were introduced. In every case history has repeated itself. The early years of vital registration have seen incomplete and inaccurate returns, but with the passage of time bringing increasing efficiency of the organisation and the spread of knowledge of the requirements, these defects have increasingly disappeared.

The initial declaration or reporting of these vital phenomena will present problems. A widely organised group or service which comes into intimate contact with all Native races and areas will be necessary. Existing district and assistant district registrars, who collect the information of European births and deaths in the country, will not suffice, as intelligence of these events in the Native areas does not reach them, nor are they in a position generally to secure this.

The committee considered that assistant district registrars of a type and class who could easily and fairly accurately obtain intelligence of births and deaths in Native rural communities were obtainable for the country as a whole, viz. (*a*) Native school teachers for the Native territories, districts and locations proper, (*b*) police patrols for farm areas. The educational systems for Natives in each province, are sufficiently widespread to ensure every Native community of any size being reached by them. The Native schoolmasters being relatively intelligent, able to read and write, and usually of a reliable type, should be capable of serving as efficient assistant district registrars. Little effort or propaganda on their part should lead to a flow to them of reports of births and deaths in their respective areas. The more remote districts are naturally not so well served by schools, but all in all the Native school organisation is such as to expect from it a nation-wide cooperation of some value in building up a statistical service for Native areas.

In regard to farm areas the school cannot be looked to for such direct support. Here the police would be the only organisation common to the country as a whole in a position to secure facts of births and deaths. Police patrols visit all farms at regular intervals, and as police functioned fairly

successfully in pre-Union days in certain of the provinces at this duty, it is probable that they would meet the need for farm areas in a way that no other organisation could.

It will be readily realised that no real information of the numbers of births and deaths occurring annually was available on which to base true estimates of the work likely to arise if the system proposed by the committee were adopted. Using European figures as a basis, almost certainly a low estimate, it was estimated that there would be approximately 160,000 Native births annually and approximately 70,000 Native deaths annually.

On this rough calculation it was suggested that when *all* Native births and deaths are registered the quantity of vital registration material to be handled by the existing machinery of the Office for Registration of Births, Marriages and Deaths and by the Office of Census and Statistics would be trebled. This does not imply that the organisation will have to be trebled; the registration of births and deaths is not the whole function of these offices, and, further, any large increase in the numbers of births and deaths does not require a corresponding increase in departmental organisation. This organisation is largely in existence and but little capital expenditure would be required for the expansion in work. In the central office further clerical assistance would be required, but it is believed that this demand will only arise gradually. Similarly, the machine work will probably only see a gradual increase and will not involve any large increase in tabulating and sorting facilities.

The committee points out that though the complete success of the scheme will see a threefold increase in the work of births and deaths registration, new expenditure and staff are not likely to be demanded to anything like the same extent.

III.—ADMINISTRATIVE MATTERS.

1. *Staff.*—The organisation and functions of the Department and its principal personnel are set out in Annexure "A". The appointment of officers to fill the professional posts in the Department caused by the retirement or approaching retirement under the age limit of senior officers is a matter which will require early consideration. Prior to the passing of the South Africa Act and the establishment of provincial councils the several Governments which entered into Union were able to recruit as health officers promising medical men with prior experience in local government and health administration and to ensure that all became fully conversant with every aspect of local government work in the colony concerned after they had joined the service.

On the establishment of Union the administration of local government was assigned to the provinces and departmental officers appointed after the passing of the Public Health Act were not able to have the same opportunity of acquiring a first-hand knowledge of the working of the various provincial laws. Further, the salaries paid to the senior government health officers compared unfavourably with those offered generally by the larger local authorities so that the Department lost some of its most promising officers to local authorities and was not able, in return, generally to recruit health officers from municipal and other local government service.

Dr. F. C. Willmot, Senior Assistant Health Officer, Capetown, was due normally to retire from the Public Service on the 8th December, 1936, but his service was specially extended as Deputy Chief Health Officer to the 8th September, 1937. The local government branch of the Cape Colony was at Union a part of the sub-department of health for that colony. For several years after Union the Provincial Administration had its own health officer, but with the passing of the Public Health Act Dr. Willmot, who was appointed the Senior Health Officer stationed in Capetown, became as such the official health adviser to the Province. In this capacity he has been called upon continually to advise the Administration and the local authorities in the Province on many important matters of local government in connection with which his ripe knowledge of public health, coupled with an unrivalled experience of the local government system of the Cape Province, has been of the greatest value to all concerned. Dr. Willmot has been a loyal, hard-working public servant and his retirement is a very serious loss indeed to the Department. He has been succeeded in the post of Deputy Chief Health Officer, Capetown, by Dr. Peter Allan, formerly Medical Superintendent of Nelspoort Sanatorium, and latterly Assistant Health Officer, Capetown, whose services will also be used generally in connection with the direction of the tuberculosis campaign.

On the 9th June, 1938, Sir E. N. Thornton, the Secretary for Public Health and Chief Health Officer is due to retire under the age limit. The same applies to Dr. L. Fourie, Senior Assistant Health Officer, Johannesburg, whose retiring date is 4th December, 1938, and Dr. G. A. Park Ross, Deputy Chief Health Officer, Durban, whose retiring date is 19th January, 1939.

In view of the difficulties of giving junior health officers in the Department a real grounding after joining the Department in local government administration as it exists to-day, it would seem very desirable that future appointments as assistant health officers should, as far as possible, be made from officers who have had a successful period of service in well organised municipal health departments.

In this connection the present method of filling professional appointments in the Department and of making promotions therein is not altogether satisfactory. These are made by the Minister on the recommendations of the Public Service Commission. The latter body, before making a recommendation, consults the head of the Department.

The Commission is required by law to consider the claims of any officer in the public service who holds the necessary qualifications for any vacancy before recommending the appointment of an officer from outside the service. The Department is probably unique in so far that experience elsewhere in the service is of little or no value for a health officer. The health officers of the Department should be experienced in health work before appointment.

The experience of this Department in the past has been broadly that it is a hopeless proposition to expect a middleaged practitioner, who for fifteen to twenty years has been doing routine medical work, other than public health, to be expected on appointment as a health officer to be a success in his new post. He is rarely able to master and deal efficiently with the varying problems of the Department and of local authorities as they are presented to him.

The possession of a higher diploma in surgery does not mean that a medical practitioner with such a diploma is a skilful surgeon. It merely means that he has had additional training in surgery and possesses at the time he passes the examination a knowledge of the subject up to the standard required.

Similarly the possession of a diploma in public health does not mean that every holder of such a diploma has a flair for public health. That can only be ascertained in actual practice after he has obtained the diploma.

In view of the position in which the Department will be placed during the next few years owing to the pending retirement of senior professional officers, I am very definitely of the opinion that from now onwards every vacant post of assistant health officer occurring in the Department should be advertised and that such posts should invariably be filled by officers who have been tested out in public health work and have been found to have a definite flair for such work. The appointment of middleaged practitioners without previous experience in public health will inevitably lead to inefficiency in the working of the Department.

The matter was discussed at the last meeting of the Council of Public Health in January, 1937, and it was felt that the whole question should have the early consideration of the Government.

The most important change in administrative matters made during the year was the grading up of certain of the senior professional posts. An increase in emoluments was long overdue, but, in the case of the Deputy Chief Health Officers, the emoluments are still insufficient to make the public health service of the Government attractive to the best men; attention has frequently been drawn to the anomaly of full-time municipal medical officers of health receiving considerably higher salaries than the senior professional officers in the Union Health Department. A motion seeking to remedy this state of affairs was passed by the South African Society of Medical Officers of Health at its meeting in Pietermaritzburg in July, 1936.

The posts of Senior Assistant Health Officer occupied by Drs. F. C. Willmot (Cape), G. A. Park Ross (Durban) and E. H. Cluver (Head Office, Pretoria), were re-designated Deputy Chief Health Officers as from 1st January, 1937, and a salary of £1,400 was allotted to each post. The post of Assistant Health Officer held by Dr. L. Fourie (Johannesburg) was regraded to that of Senior Assistant Health Officer and his salary increased to £1,300.

Other changes in the professional staffing included the conversion of the part-time assistant district surgeoncy at Durban into a full-time post; the post of part-time District Surgeon, Bronkhorstspruit, was converted into a full-time post, styled Assistant District Surgeon, Pretoria District; at Capetown Dr. H. A. Shapiro was appointed to the newly created post of Pharmacologist on the staff of the Biological Control Laboratories.

On the clerical side the only important change was the regrading of the post of Senior Clerk, Housing Section, occupied by Mr. J. Sanders, to that of Principal Clerk functioning as Secretary to the Central Housing Board.

2. *District Surgeons.*—The present distribution of district surgeons is set out in Table B.

TABLE B.—DISTRICT SURGEONCIES AND ADDITIONAL DISTRICT SURGEONCIES AS AT 30TH JUNE, 1937.

Province.	Whole-time.	Whole-time, but jointly with local authority or public body.	Part-time.			Total.
			On inclusive annual salary.		On annual salary with certain supplementary fees and allowances.	
			District Surgeons.	Additional District Surgeons.		
Cape.....	5	5	—	23	134	167
Natal.....	3	—	—	2	43	48
Transvaal.....	8	1	1	20	57	87
Orange Free State..	1	—	—	13	47	61
UNION.....	17	6	1	58	281	363

The seventeen whole-time officers are those at Capetown (2); Durban (3); East London; Port Elizabeth; Pretoria (3), (one stationed at Bronkhorstspruit); Johannesburg (4); Pietersburg; Bloemfontein; and Wynberg.

Periodical Tours by District Surgeons under section 4 of Act No. 36 of 1927.—The primary object of these tours is to bring medical aid within reasonable reach of the general public of localities concerned and along the lines of travel, going and returning, and to combine this with preventive action in regard to any matter affecting or likely to affect the health of individuals or families or of the public.

An outstanding condition under which these tours are authorised is that a district surgeon has to furnish an undertaking in writing to the effect that he will be prepared to see and treat private patients at the out-stations and on the lines of travel at the same fees as he charges patients seen at his head-quarters consulting rooms. Private patients living in the outlying areas avail themselves of this opportunity to a considerable extent.

During the course of the financial year ended 31st March, 1937, tours were carried out in 69 district surgeoncies at a cost of £9,370. A total of 45,137 patients was seen and treated by the district surgeons—23,523 Government patients and 21,614 private patients. On the current financial year's estimates an amount of £11,000 has been provided for this purpose, but this amount will have to be increased as several further requests reached this Department, which it has not been possible to authorise owing to the insufficiency of funds provided. Every care has been taken to arrange these tours so as not to interfere unduly with private medical practice, and the advice of the Medical Association of South Africa has been freely sought whenever difficulties appeared likely to arise in this connection.

3. *Local Authorities and their Health Staffs.*—The numbers of the various classes of local authorities under the Public Health Act as at 30th June, 1937, are shown in Table C.

TABLE C.—LOCAL AUTHORITIES UNDER THE PUBLIC HEALTH ACT (1919) AS AT 30TH JUNE, 1937.

Province.	Municipalities.	Village Management Boards.	Local Boards.	Village Councils.	Health Committees.	Local Administration and Health Boards.	Magistrates.	Divisional Councils.	Board of Health.	Mining Commissioners.	Total.
Cape.....	132	95	22	—	—	—	28	95	1	1	374
Natal.....	11	—	15	—	19	8	43	—	—	—	96
Transvaal.....	32	—	—	28	40	—	47	—	—	3	150
Orange Free State	62	6	—	—	—	—	39	—	—	1	108
UNION.....	237	101	37	28	59	8	157	95	1	5	728

Whole-time medical officers of health are now employed by fifteen of the municipalities listed, namely, Benoni, Bloemfontein, Boksburg, Capetown, Durban, East London, Germiston, Johannesburg, Kingwilliamstown, Krugersdorp, Pietermaritzburg, Port Elizabeth, Pretoria, Roodepoort-Maraisburg and Springs. The Divisional Council of the Cape also employs a whole-time medical officer of health. With effect from the 1st May, 1936, an agreement was entered into between the Department of Public Health, the Kimberley Board of Health and the Kimberley Municipality under which a whole-time medical officer of health and an assistant medical officer

were appointed who combined the duties of medical officers to the local authorities with those of district surgeon and assistant district surgeon. At Grahamstown and Queenstown there are whole-time officers who carry out the combined duties of district surgeon and medical officer of health to the municipal and divisional councils. There is a similar arrangement at Brakpan where a whole-time officer combines the duties of district surgeon with those of medical officer of health to the municipality.

On the 30th June, 1937, 125 local authorities—52 in the Cape, 38 in the Transvaal, 16 in Natal and 19 in the Orange Free State—employed 322 sanitary inspectors and 86 health visitors.

IV.—WORK OF THE DEPARTMENT.

1. *Inspections, Investigations and Field Work.*—Accounts are given in the appropriate sections of this report of the investigations and field work carried out by the officers of the Department. Emergency work connected with infectious diseases must necessarily be given preference over routine constructive work. As such emergency work in connection with epidemic diseases like typhus, plague and malaria, bulks very largely in the Department's activities, there is real danger of the less urgent, but none the less important, constructive work being neglected.

Under this latter head are included the systematic hygienic inspections of local authority areas which have not a properly constituted municipal health department. Such local authorities which are not served by a full-time qualified medical officer of health need frequent guidance if gross sanitary faults are to be avoided. The importance of this will be realised when it is borne in mind that only a relatively small proportion of local authorities employs a full-time medical officer of health.

2. *Publications by Members of the Staff*:—

Sir E. N. Thornton, *Chief Health Officer.*

"Health and Social Welfare." (Report of the National Conference on Social Work, October, 1936.)

"A review of some of the activities of the Union Health Department." Paper read at meeting of non-European Health Society, Lovedale, May, 1937.

Dr. E. H. Cluver, *Deputy Chief Health Officer.*

"Medical Training in the U.S.S.R." Paper read at meeting of the Southern Transvaal Branch of the Medical Association of South Africa, 25th February, 1937. (*South African Medical Journal*, 22nd May, 1937.)

"A Revolution in Medical Practice." Paper read at meeting of Northern Transvaal Branch of the Medical Association of South Africa, 9th March, 1937. (*South African Medical Journal*, Vol. XI, No. 20, 1937.)

"An Experiment in Social Hygiene." (*British Medical Journal*, 29th *May*, 1937.)

"Health Provision for the Masses." (*The Leech*, Vol 8, No. 1, May, 1937.)

"Cancer Prevention in the Union." Address at the Annual Meeting of the National Cancer Association of South Africa, 30th April, 1937.

"Infectious Disease Legislation." Addresses to Mine Medical Officers on the Witwatersrand, March, 1937.

Dr. F. W. P. Cluver, *Assistant Health Officer.*

"The Urban and Rural Aspects of Enteric Fever Control." (*South African Medical Journal*, June, 1937.)

Dr. H. S. Gear, *Assistant Health Officer.*

"South African Public Health Services." (*South African Medical Journal*, Vol. XI, 1937, p. 13.)

"A Plea for Improved South African Vital and Medical Statistics." (*South African Medical Journal*, Vol. XI, 1937, p. 149.)

"Epidemiological Notes on Scarlet Fever in China." (*Chinese Medical Journal*, Vol. LI, 1937, p. 203.)

Dr. B. F. Sampson, *Government Pathologist (Durban).*

"Bacteriological Aspects of Enteric in South Africa." (*South African Medical Journal*, 12th June, 1937.)

Dr. M. H. Finlayson, *Officer-in-Charge, Biological Control Laboratories, Capetown.*

"Knoppie Spider." (*South African Medical Journal*, 14th November, 1936.)

"Specific Antivenene in the Treatment of Knoppie Spider Bite." (*South African Medical Journal*, 13th March, 1937.)

"Lymphagranuloma Inquinale in South Africa." (*South African Medical Journal*, 8th May, 1937, with Dr. F. W. F. Purcell.)

Dr. H. A. Shapiro, *Pharmacologist, Biological Control Laboratories, Capetown.*

"Effect of Testosterone Propionate on Mating" (1937, *Nature* 139, 588).

"Induction of Ovulation by Testosterone and Related Compounds." (*Chem. and Ind.* 55, 1031.)

"Biological Basis of Sexual Behaviour in Amphibia." (1937, *J. Exp. Biol.* 14, 38.)

"Influence of Progesterone and of Testosterone on Xenopus and its Excised Ovary." (*J. Physiol. Proc.* 89, 3.) (With Dr. H. Zwarenstein.)

"The Melanphore Contracting Principle of the Pineal." (1937, *Chem. and Ind.* 56, 190.) (With Drs. D. Beall and H. Zwarenstein.)

In addition to the publications enumerated above numerous popular addresses on public health subjects were delivered by members of the staff to gatherings convened by local authorities and other organisations.

3. *Health Publicity and Educative Work.*—In Annexure B (i), pamphlets and leaflets which have been prepared, published and distributed by the Department to date, are furnished. In Annexure B (ii) is a list of films owned by the Department which are available to local authorities and public bodies for exhibition purposes. A set of small models, specially made for

the Department by a health inspector, is stocked by the Department's health officers at Pretoria, Capetown and Durban for loan to local authorities and other bodies which have no sets of their own for demonstration during "health weeks" and on similar occasions and for illustrating lectures on hygiene. A list of these models is given in Annexure B (iii).

One of the most cheering and significant signs of the times is the changing attitude of mind towards health and recreation and matters of that kind of the younger generation. I suppose Disraeli was the first statesman in Europe to realise what health can mean in the life of a nation. Shakespeare has lent currency to the idea that names do not matter but what may be true of roses is not necessarily true of human activities. When it comes to these a name may not be merely descriptive but it may also set a standard and a goal: A Ministry of Health! What more splendid title could there be or what finer goal of national endeavour than that of a nation healthy in body as in mind, living in fair, clean and sunlit surroundings, breathing abundance of pure air, drinking pure water and eating health sustaining food. At present the name of the Ministry is still somewhat more of an aspiration than that of an accomplished fact. There is much talk of health but, as a rule, the public is apt to think less of health than of disease. The Department feels that there is room for a profound readjustment of perspective. The nation must be made health conscious and health minded rather than sickness conscious and sickness minded. This can only be done on educational lines and it is for the development of health education and a better health perspective that reform still seems to be necessary in spite of the considerable advances which have been made in the schools in this respect in recent years.

There is room for improvement in health instruction in the schools and in the propaganda of the Department and of local authorities and the scheme under which much of this propaganda may be undertaken by the South African Red Cross Society in co-operation with the Department and local authorities would seem to offer the best chance of success.

4. *Laboratories.*—The work done by the Government laboratories at Capetown and Durban and that carried out on behalf of the Government at the South African Institute for Medical Research, Johannesburg and Port Elizabeth, is shown in Table D.

TABLE D.—PATHOLOGICAL LABORATORIES: ANALYSES AND EXAMINATIONS, YEAR ENDED 30TH JUNE, 1937.

Particulars.	Laboratories.		South African Institute for Medical Research.	
	Capetown.	Durban.	Johannesburg.	Port Elizabeth Branch.
Specimens Examined for—				
Government Departments—				
Agriculture	1	11	—	—
Customs and Excise	43	—	2	—
Defence	709	45	1,394	—
Interior (Mental Hospitals, etc.)	1,080	293	1,198	91
Justice	—	240	1,391	293
Justice (Prisons)	1,527	154	1,617	64
Mines (including Miners' Phthisis)	82	—	12,465	—
Posts and Telegraphs	—	—	—	—
Public Health (including Leper Institutions)	9,385	50,503	50,192	6,711
Public Works	—	3	—	—
South African Railways and Harbours	98	2,813	—	—
Other Government Work	89	72	488	47
General Hospitals (Provincial)	2,301	7,107	38,933	9,542
Local Authorities	34,072	25,788	5,625	12,609
Medical Practitioners	14,271	12,843	24,869	1,928
Department of Education (Provincial)	—	811	—	—
Other Governments or Administrations	—	—	343	—
Others	277	—	185	16
TOTAL	63,935	100,683	138,702	31,301
Manufactures and Issues—				
Autogenous Vaccines....c.c.	2	25	30,350	4,900
Bacterial Vaccines (stock)....c.c.	—	—	718,474	†
Tuberculin Dilutions....c.c.	—	—	—	155
Sera (various), Bacterial Filtrates....c.c.	—	—	1,179,120	†
Anti-rabic Vaccine....c.c.	41,000	—	—	—
Chaulmoogra Oil Preparations....c.c.	262,000	—	—	—
Smallpox Vaccine—Calf Lymph (prepared at Vaccine Institute, Rosebank)..tubes	1,288,000*	—	171,259	245
Others....doses	—	—	141,127	—
Attendances at Courts of Law by Members of Staff	318	1	8	3
Total 'Days' Absence entailed by such attendances	23	1	12	10

* Manufactures only; 1,541,615 tubes were issued.
† Included in Johannesburg figures.

5. *Biological Control Laboratories.*—During the year there was an increase in the number and range of products examined by the Biological Control Laboratories. Samples of insulin, arsphenamine derivatives and tuberculins were controlled and additional licences for the import of therapeutic substances were granted to importers in the Union.

Laboratories engaged in the manufacture of therapeutic substances, including autogenous vaccines, were inspected, and also the premises of agents granted licences to import therapeutic substances into the Union. In some cases recommendations for improvement in premises or equipment were made and all such recommendations were carried into effect. In the case of several importers who were found to be importing therapeutic substances without complying with the provisions of paragraph (*a*) of sub-section (2) of section 23 of the Therapeutic Substances Regulations, warnings were issued. Assurances were obtained from such importers that the regulation requirements would in future be strictly adhered to.

Whilst a number of additional import licences were granted to enable therapeutic substances to be imported into the Union, one application for an import licence was refused on the grounds that samples of the product for which a licence was desired were found on examination to be grossly contaminated with pathogenic bacteria.

The number of licences issued under the Therapeutic Substances Regulations since the promulgation of the Regulations on 9th August, 1935, is shown in Table E (i).

TABLE E (i).—LICENCES ISSUED UNDER THE THERAPEUTIC SUBSTANCES REGULATIONS, GOVERNMENT NOTICE, No. 1131 OF 1935.

Therapeutic Substances.	Manufacturing Licences Issued.		Import Licences Issued.		Research Licences Issued.	
	1935–6.	1936–7.	1935–6.	1936–7.	1935–6.	1936–7.
Antitoxic and bacterial sera	2	—	6	1	10	—
Antigens and bacterial vaccines	11	—	12	2	10	—
Arsphenamines and derivatives	—	—	5	2	10	—
Insulin	—	—	10	2	10	—
Pituitary (Posterior Lobe) Extract	—	—	11	3	10	—
Sterilized Surgical Ligatures and Sutures	—	—	6	2	10	—

Altogether 162 samples of therapeutic substances were examined. These examinations were carried out under the Therapeutic Substances Regulations published under Government Notice No. 1131 of 9th August, 1935, and are summarized in Table E (ii).

TABLE E (ii).—EXAMINATIONS CARRIED OUT UNDER THE THERAPEUTIC SUBSTANCES REGULATIONS.

Name of Product.	Manufactured in Union. No. examined.	Imported into the Union. No. examined.	Number unsatisfactory.
Bacterial Vaccines	30	19	1
Schick Test Toxin	16	—	3
Diphtheria Prophylactic	5	1	—
Tuberculin	—	4	—
Anti-Dysentry Serum Shiga	2	—	—
Diphtheria Antitoxin	16	10	1
Tetanus Antitoxin	11	4	—
Gas-gangrene Antitoxin Perfringens	2	2	1
Arsphenamine and Derivatives	—	7	1
Insulin	—	6	1
Pituitary (Posterior Lobe) Extract	—	6	—
Sterilized Surgical Sutures	—	21	1
Total Number Examined	82	80	9

Nine of these samples were found to be unsatisfactory. The unsatisfactory sample of bacterial vaccine was manufactured outside the Union and was submitted by Customs for examination. Altogether five phials of this vaccine were examined and from each phial the same pathogenic bacterium was isolated. The entry of the vaccine into the Union was prohibited.

Three samples of Schick test toxin found to be unsatisfactory were below the potency laid down in section A of Part 2 of the Regulations. These samples were examined late in 1936. All samples of Schick test toxin tested in 1937 were found to comply in every respect with the regulation requirements.

One sample of diphtheria antitoxin was found to contain insufficient excess to permit of the issue of the batch as containing the number of units of antitoxin at the date of expiry stated on the labels.

The sample of perfringens antitoxin which was found unsatisfactory did not possess the potency stated on the label. All samples of this batch were recalled by the manufacturer and further batches of this manufacturer's perfringens antitoxin were found to be satisfactory when examined.

The unsatisfactory sample of neoarsphenamine did not possess the therapeutic activity required by the Therapeutic Substances Regulations. In addition it was more toxic than the standard preparation of neoarsphenamine. The importation of this batch of neoarsphenamine was prohibited and the manufacturer was instructed that all further consignments of arsphenamine derivatives manufactured in his laboratories would be refused admission to the Union until on examination in the Biological Control Laboratories, they were found to comply with the provisions of the Therapeutic Substances Regulations.

One sample of insulin was found to be below the potency claimed by the manufacturer. A sample of catgut submitted by a hospital was found to be contaminated. On investigation the contamination was traced to the hospital methods of storing catgut.

A number of samples of *Digitalis pulverata* B.P. and *Tinctura digitalis* B.P. were examined under the provisions of sub-section (1) of section 5 of Act No. 13 of 1929. The results of these examinations are shown in Table E (iii).

TABLE E (iii).—EXAMINATIONS CARRIED OUT UNDER THE FOOD, DRUGS AND DISINFECTANTS ACT, No. 13 OF 1929.

Name of Product.	No. Examined.	No. Unsatisfactory.
Digitalis Powder B.P.	4	—
Tinct. of Digitalis B.P.	43	10
Total Number of Samples Examined	47	10

The unsatisfactory samples of *Tinctura digitalis* B.P. were found to possess less than 80 per cent. of the activity of a tincture of digitalis prepared from International Standard Digitalis Powder, the comparison being carried out as laid down in the British Pharmacopoeia 1932. Following the publication of the Addendum to the British Pharmacopoeia in 1936, all examinations of *Digitalis pulverata* B.P. and *Tinctura digitalis* B.P. were carried out using the Second International Standard Digitalis of 1936.

Research on problems of standardisation of biological products has been carried out during the year. The deterioration of digitalis tinctures, stored under various conditions of temperature, has been studied and also the ratio of the potency of the British Standard Digitalis (1928) to the potency of the International Standard Digitalis (1926) using *Xenopus laevis* as the test animal. In addition an attempt has been made to produce a mortality curve for Ouabain using *Xenopus laevis* as the test animal. As differences in mortality produced by a given dose of ouabain, may occur at different seasons of the year, it is necessary that these experiments should be continued over a period of at least 12 calendar months.

Work on the production of standard serum preparations for the assay of cobra and puffadder antivenenes has continued and a method of assay has been devised which has proved satisfactory.

Preparations of puffadder and cobra antivenenes have been carefully dried *in vacuo* and sealed under nitrogen. When tested 12 months after drying, no loss of activity was noted. It is intended that samples of these provisional standards shall be issued to the principal laboratories manufacturing antivenenes for sale in the Union. It is hoped that these provisional standard antivenenes will be used over a trial period. At the end of that time it should be possible for a unit of antivenene to be accepted which would enable the provisions of section F of Part IV of the Therapeutic Substances Regulations (Government Notice No. 1131 of the 9th August, 1935) to be applied within the Union.

During the year, a number of requests for assay of vitamin-containing medicinal preparations and for the assay of gonadotropic and sex-hormone preparations were received. International standards preparations are now available for the following vitamines: vitamin A (β carotine), vitamin B,

vitamin C (l-ascorbic acid), and vitamin D (calciferol). The Addendum to the British Pharmacopoeia lays down methods of assay of vitamins A, B, C and D, and also standards for the vitamin activity of cod-liver oil, solutions of calciferol in oil and ascorbic acid. Many commercial firms issue products stated to contain vitamins. It is hoped that in the near future, an active control may be exercised over these products.

The number of sex-hormone and gonadotropic preparations which are being offered to the medical profession in the Union has already reached large dimensions.

It is now possible to obtain the male and the female sex hormones as substances of crystalline purity. International standards prepared for the Permanent Commission on Biological Standardisation of the Health Organisation of the League of Nations and held for international distribution by the Department of Biological Standards, the National Institute for Medical Research, Hampstead, London, are to-day available for the male sex hormone (androsterone) and the female sex hormones (oestrone; oestradiol monobenzoate). It appears likely that the more active male hormone, testosterone, will shortly replace androsterone as the international standard. The preparation of the international standard for the *corpus luteum* hormone (progesterone) is nearing completion.

Although these substances are of crystalline purity, the most reliable methods of qualitative detection and quantitative assay depend on biological tests.

In view of the increasing clinical uses to which the various forms of these substances are put, and as highly active preparations must be administered in massive dosage in order to produce the required action, it is necessary that adequate biological control over the variety of sex hormones, at present marketed without restriction, should be exercised in the near future.

Whilst the structure of the pituitary and the pituitary-like hormones has not yet been elucidated, it is to-day possible to prepare these substances in the form of highly concentrated dried powders which can be stored indefinitely without loss of activity. The blood and the urine of pregnant animals afford a very rich source of the pituitary-like substances.

On the initiative of the Chairman of the International Conference held in 1935 in London under the auspices of the Permanent Commission on Biological Standardization of the Health Organization of the League of Nations to consider international standards for sex hormones, attempts are at present in progress to obtain a sufficient supply of the necessary materials to establish international standards and tests on the basis of the following substances: the gonadotropic substances in human pregnancy urine and in pregnant mare serum; the gonadotropic, the thyrotropic and the lactogenic hormones of the anterior pituitary gland.

This Department has accepted an invitation to co-operate in this programme. It should be possible, therefore, within the coming year to exercise a very much needed control over the great variety of unstable pituitary and pituitary-like substances at present marketed.

The international standard for the active principles of the posterior lobe of the pituitary gland has remained unchanged.

Since the International Conference which met in Geneva in 1935 when the international standard preparation of insulin was agreed upon, a very much more highly purified and more potent crystalline substance has been prepared. This has led to the replacement of the 1935 International Standard Insulin (8 units per milligramme) by a new International Standard Insulin (22 units per milligramme).

The recent discovery of a preparation consisting of insulin combined with zinc and protamine raises new problems in the assay of insulin preparations. This combination exerts a much more prolonged action on the blood sugar than ordinary insulin and its use in the treatment of diabetes is rapidly increasing. Several licences for the import of this preparation into the Union have been granted and improvements in the method of assay are being devised.

The appointment in 1937 of Dr. H. Shapiro as full-time Pharamacologist has enabled an increased number of samples of digitalis preparations, pituitary posterior lobe extracts and insulin to be examined. The experience of this officer in the assay of sex hormones and gonadotropic substances at the National Institute for Medical Research, London, will enable the Biological Control Laboratories to undertake the assay of these substances in the Union in the near future.

On the 2nd April, 1937, amended Therapeutic Substances Regulations were promulgated which come into force on 1st October, 1937. The Amended Regulations provide for the control of staphylococcus toxoid

and antitoxin, pneumococcus Type I and Type II antisera, gas-gangrene antitoxins (oedematiens and *Vibrion septique*), and amend the regulations already in force for the control of diphtheria prophylactic. Provisions are also laid down to ensure that all importers of therapeutic substances will provide adequate refrigeration for the storage of such substances, if they are to be retained in stock for a period greater than three months after importation into the Union.

In addition it has been found necessary to provide for the restriction of the granting of import licences except to registered medical practitioners or registered chemists and druggists.

The regulations relating to the labelling of sterilised surgical ligature or suture have also been amended to provide for the batch number being borne by each and every sealed container of sterilised ligature and suture and not only by the outer container.

So rapidly is the work of the Biological Control Laboratories increasing that the laboratories provided in 1935 are already inadequate. It will be necessary at an early date to consider the provision of extended laboratories and increased staff to enable the control of vitamin-containing preparations, sex hormones and pituitary substances to be adequately carried out.

During the year close collaboration with the Department of Biological Standards, National Institute for Medical Research, London, has been maintained, and the regular supply of international standards by that Department, has been much appreciated.

6. *Port Health Administration.*—Strict supervision is maintained at all ports to preclude the possibility of infection being introduced into the Union from ships entering our waters. The health measures carried out during the year are summarized in Annexure C at the end of this report.

No cases of any of the major infectious diseases—cholera, plague, smallpox, yellow fever or typhus—were introduced into our ports by ships during the year. One case of relapsing fever, known in East Africa as tick typhus, was landed at Durban from the S.S. " Llandaff Castle " on 2nd May, 1937. The patient, a girl of ten years, embarked at Mombasa after a journey by train from Nairobi, during which a tick was found on the child's head. The illness commenced during the voyage and lasted about ten days. By the time Durban was reached the child had completely recovered and she was allowed to proceed to her home.

During the prevalence of influenza in Europe towards the end of 1936, precautionary measures were taken in an endeavour to prevent the introduction of infection into the Union. Altogether 260 cases of influenza were reported as having occurred on vessels on the west coast voyage to Capetown. With two exceptions all of these patients had recovered before arrival at Table Bay. These had developed one into broncho-pneumonia, the other into bronchitis. Both were removed to the City Hospital for further treatment. The ships on which these influenza infections were reported were very thoroughly disinfected. No further cases occurred on them during their subsequent journey up the east coast towards Durban.

Cases of infleunza were also reported on a number of vessels on the direct voyage to Durban. Here too, patients were admitted to hospital. The ships were given restricted pratique, being closed to all visitors except persons proceeding on board for the actual working of the vessel while in port.

The S.S. " Tanafjord " arrived at Capetown with one person dead and one acutely ill. Local laboratory examination proved the cause to be typhoid. Everyone on board the vessel was accordingly innoculated with a prophylactic dose of T.A.B. vaccine. The ship's water supply was pumped into the sea, and all tanks were disinfected before being refilled with fresh water. The affected cabins and quarters were also disinfected, and the ship was allowed to continue on its way after it had been ascertained that no one on board was running an abnormal temperature.

There was a considerable increase in the incidence of measles in transit during the year. Most of the cases occurred on Japanese vessels. These ships were thoroughly inspected and granted only restricted pratique; all children under the age of 12 years were prohibited from going ashore.

Cases of venereal diseases among persons not landing at our ports also showed an increase. Where the vessels concerned were found to be without facilities for the treatment of such diseases the cases were removed at Capetown to the City Infectious Diseases Hospital for treatment at the expense of the ships' agents.

No cases of rodent plague occurred in any of the harbour areas during the year. Anti-rodent measures including demolition of harbourage places, trapping and poisoning continue to be energetically caried out.

Shipping at Union ports is increasing in amount. This is particularly true of Capetown which has now been proclaimed an open port where vessels are allowed to enter after sunset.

V.—INFECTIOUS AND PREVENTABLE DISEASES.

1. *Notifications.*—In Table F are shown the numbers of infectious diseases notified by medical practitioners during the year, the totals for the previous year being inserted for comparison. This table does not by any means give a correct statement of the numbers of notifiable diseases which have occurred as many cases of such diseases, particularly when occurring among Natives, are never seen by a medical practitioner, and are consequently not notified.

Table F.—Notification of Diseases by Medical Practitioners during the Years Ended 30th June, 1936, and 30th June, 1937.

Disease.	Year Ended 30th June, 1936.	Year Ended 30th June, 1937.										
	Union.	Union.	Cape Province, excluding Transkei.		Transkei.		Natal.		Orange Free State.		Transvaal.	
	Total.		European.	Non-European.	European.	Non-European.	European.	Non-European.	European.	Non-European.	European.	Non-European.
Anthrax	79	75	3	24	—	15	1	3	1	9	5	14
Diphtheria	1,741	1,847	756	322	8	9	191	62	51	8	390	50
Encephalitis, Infective	32	40	8	14	—	5	—	—	—	—	7	6
Enteric or Typhoid Fever	4,404	4,205	472	744	9	131	88	319	136	311	468	1,527
Erysipelas	532	537	112	56	5	2	21	4	10	5	186	136
Lead Poisoning	11	1	1	—	—	—	—	—	—	—	—	—
Leprosy	755	688	5	62	—	237	1	146	1	36	1	199
Malta Fever	15	4	—	—	—	—	—	—	—	—	4	—
Meningitis, Epidemic Cerebro-spinal	630	677	46	87	1	6	6	15	1	10	76	429
Ophthalmia, Gonorrhoeal	79	72	14	30	—	—	1	10	—	4	6	7
Ophthalmia Neonatorum	410	440	53	153	—	13	4	18	2	29	103	65
Plague [for detailed list of cases and deaths, see Table I (i)]	253	52	2	18	—	—	—	—	6	25	1	—
Poliomyelitis, Acute	26	82	19	8	—	2	4	3	5	10	29	2
Puerperal Fever, including Puerperal Sepsis	469	462	61	125	—	14	10	27	2	11	101	111
Rabies	9	31	5	4	—	—	—	—	12	5	2	3
Scarlatina or Scarlet Fever	2,569	1,998	805	49	2	3	123	4	172	5	824	11
Smallpox (for detailed list of cases and deaths, see Table J)	24	27	—	1	—	5	—	—	—	10	—	11
Trachoma	66	68	11	21	1	—	3	6	—	1	5	20
Tuberculosis	8,755	10,551	466	4,437	7	2,415	127	1,242	12	223	100	1,522
Typhus Fever [for detailed list of cases and deaths, see Table L (iv)]	1,605	1,007	26	267	1	400	5	84	2	176	2	44
Totals	22,464	22,864	2,865	6,422	34	3,257	585	1,943	413	878	2,310	4,157

2. *Bilharziasis or Schistosomiasis.*—The bilharzia parasite continues to damage the health and thereby the efficiency of large sections of the population, European and Bantu, in the northern and eastern portions of the country. Much is being done by way of propaganda to educate the people in these regions in the methods of prevention. Much yet remains to be done before it can be claimed that any material advance against the disease has been made.

The two provinces mainly concerned are Transvaal and Natal, although considerable infestation also occurs along the east coastal area of the Cape Province. Only in the Transvaal is there a provincial committee actively engaged in combating the ravages of the disease. Provision has now been made on the estimates of the current year for the establishment of a bilharzia committee in the Province of Natal. It is to be hoped that no further time will be lost in organising an active campaign.

The first essential in an anti-bilharzial campaign is an accurate survey of the affected areas. It is necessary to know the exact distribution of the snail vectors. Such a survey was commenced in 1935. It is being conducted by the malaria field staff in the course of their duties in connection with malaria which must, of course, take priority being the more serious national problem.

The information collected in the lowveld of the Eastern Transvaal during the two years of the survey may be summarised as follows:—

Snail.	Number Collected.	Running Water.				Standing Water.					
		(*a*)	(*b*)	(*c*)	(*d*)	(*a*)	(*b*)	(*c*)	(*d*)	(*e*)	(*f*)
B. forskalii	339	5·85	—	6·60	—	7·15	40·05	36·8	3·55	—	—
L. natalensis	741	25·25	19·25	4·10	0·25	20·55	23·50	5·65	0·35	0·75	—
M. tuberculata	163	—	21·80	7·35	—	—	26·95	44·90	—	—	—
P. africana	384	21·80	15·70	4·70	—	32·20	18·25	0·85	—	1·00	5·5
P. costulatus	195	3·10	43·85	2·40	4·45	43·05	3·15	—	—	—	—
D. pfeifferi	852	22·55	15·55	4·20	0·10	7·45	43·55	6·50	0·10	—	—
S. patentissima var lomatiensis	10	56·25	—	—	—	—	—	—	—	—	—
TOTAL	2,684	—	—	—	—	—	—	—	—	—	—

The lettering at the head of the columns indicates the percentage of snails in each case attached to (*a*) vegetation, (*b*) rocks, (*c*) earth or mud, (*d*) dead wood, (*e*) out of water, and (*f*) floating feet uppermost (collected at 6 a.m. as this species is less evident later in the day).

A survey by the same officers of Native schools in the lowveld east of the Drakensberg and between the Swaziland and Kruger National Park boundaries yielded the following figures:—

Number of schools visited	31
Number of children examined	1,029
Number infested with *S. haematobium* ...	662
Percentage of children infested	64·3

Thirty children were examined for *S. mansoni* and four were found to be infested with this parasite.

The *Transvaal Bilharzia Committee* continued to do active work during the year. This committee is composed of representatives of the Transvaal Education Department, the South African Red Cross Society and this Department. Treatment and propaganda campaigns were organised in various areas in co-operation with the school medical officers of the Transvaal Education Department. In the Zwartruggens area 105 scholars reported to the medical officer for treatment. Of these, 102 completed the course, i.e. they received between eleven and fifteen injections each; on discharge 11 of them still showed traces of blood in the urine. At a later date, 96 of the scholars were re-examined; of these 1 still had ova and blood in the urine, while 11 showed traces of blood only. Thus 84 cases or 87·5 per cent. could be regarded as definitely cured of bilharziasis; the 11 in which traces of blood were still present must be looked upon as doubtful.

At Zwartruggens, 13 Native patients also reported for treatment, but only 7 of them remained for a course of eleven injections. Of these, 6 were re-examined some time later and the urine of 3 was found completely free of ova and blood, the others showed traces of blood, but no ova; the percentage of definite cure was, therefore, 50.

A number of children from the Silverton school in the Pretoria district was found to be infested with the bilharzia parasite. These were treated during the winter vacation at the Pretoria school clinic. Nineteen patients

reported for treatment, and all received the full course of injections. Of these, 16 reported later for re-examination and 15 were found to be completely cured, i.e. there was neither blood nor ova in the urine; the remaining case showed a trace of blood in the urine, but no ova.

Treatment of scholars was also carried out at Brits and Rustenburg during the summer vacation. These cases have not yet been re-examined, so that the degree of success cannot be recorded.

The medical officer carrying out the treatment at the various centres also arranged for active education campaigns. Lectures were given and this Department's pamphlet was distributed.

Perhaps the most important measure for combating the disease is the erection of safe swimming pools for children at or near schools in endemic areas. As the result of the activities of the Transvaal Bilharzia Committee such safe pools have been constructed at Roodekrans, Nylstroom, Doornfontein, Louis Trichardt, Groot Marico and Logieskop, while others are under construction.

3. *Diphtheria.*—The susceptibility to diphtheria varies with age. The infant up to one year of age is relatively resistant, between two years and five years is the most susceptible period, while after fifteen years the disease rarely occurs. In view of the high degree of susceptibility existing in children at school entrance age their congregation in class-rooms, hostels and playing fields creates conditions most suitable for the propagation of diphtheria. This is no mean public health problem as diphtheria is a serious disease and, in many epidemics, in spite of the availability of serum methods of treatment, its mortality is severe. This variability of mortality is one of the more interesting present-day epidemiological problems. Certain evidence has been recently accumulated which is suggestive of a change in the virulence of the organism, toxins in certain cases not being completely neutralised by existing types of serum. That complete reliance cannot be placed on treatment in avoiding fatal issues strengthens still further the desirability of preventing the disease. Unfortunately diphtheria belongs to the respiratory group of diseases spread by droplets and nuclei, a form of aerial conveyance that has recently been the subject of extremely important investigations by Wells in America. The organisms of the respiratory group of diseases, such as diphtheria, scarlet fever and others remain suspended in these so-called nuclei for fairly long periods and in such circumstances as crowded halls, and trains, and inadequately ventilated dormitories and rooms are inspired in large numbers by those present. Modern civilisation with its tendency to closer aggregation of human beings at work and play is but increasing the opportunities for such diseases to spread, and public health authorities by insisting on certain standards of space and ventilation are only counteracting to a certain extent this phenomenon. That aerial-borne infections cannot be entirely prevented by any existing general measure has placed enormous importance on the production of specific individual immunity. Such immunity develops as a slow natural process in individuals not living in isolated communities but as indicated above is absent or at its lowest ebb at the most critical age—the age when numbers of susceptible children are brought together for the first time in schools.

Nevertheless that any child should to-day die from diphtheria is in most cases an expression of negligence, if not of crime, for medical science by a series of magnificent researches has presented mankind with a most efficient means of protection. The first great public health use of this weapon was undertaken in New York where Park and Zingher instituted a wholesale immunisation of the school and pre-school children. The propaganda methods of their campaign—the millions of leaflets, posters and the largest electric sign on Broadway—had their effect as millions of injections were given by the New York health staff. The practice has spread throughout the world and there is scarcely a civilised country to-day which does not actively use one or more of the modern methods of diphtheria immunisation. Sweden, France, England and Canada have especially included the measure as an officially blessed one, and careful analysis of results has given proof of its success. Active immunisation against diphtheria is now established as an effective means of protection, the experimental stage is passed, and it behoves all authorities to ensure that diphtheria no longer constitutes a menace to the health and life of the young.

The procedure and materials as used to-day are infinitely refined compared with the crude methods of twenty years ago. Park and Zingher in New York used the toxin-antitoxin mixture, which suffered many disadvantages, as, owing to various physical and chemical interactions, certain untoward reactions occasionally occurred. The introduction of toxoid preparations has entirely altered the situation. By the action of formalin on toxin the latter's dangerous potentialities are eliminated and the so-called toxoid is produced. Intensive work is now proceeding in the laboratories of the world to refine the immunising material yet further. As Fitzgerald, who has played a leading part in Canada's noteworthy anti-diphtheritic

campaign, states, there are three essentials in the choice of a prophylactic—innocuity, high immunising value and permanence of protection.

The harmlessness of formol toxoid preparations is generally accepted, and the only contra-indications to their use are those true in any form of vaccine prophylaxis, namely skin infections, acute infections and advanced renal disease. Care is, of course, required in the immunisation of individuals giving a history of anaphylactic phenomena. A further safeguard in the avoidance of any unpleasant reaction lies in the Moloney test, which indicates those susceptible to the toxoid. However, as an administrative difficulty reactions are almost negligible, and are fortunately extremely rare in young children. It is the adolescent and adult who are the more likely to show the occasional reaction, which at its worst is not alarming.

The efficacy of the immunising power of the various preparations is undoubted. The Schick test as reported in innumerable publications shows the power of toxoid and other preparations to convert a Schick positive into a Schick negative, i.e. a susceptible into a highly resistant individual. Clinically, too, there is practically overwhelming evidence that a definite practical resistance is developed which is demonstrated most convincingly in such dangerous environments as fever hospitals. The immunisation of nurses and other members of the staff of such institutions has been followed by dramatic falls in the incidence and severity of diphtheria. Such instances, as well as examples of general population figures have been collected by Forbes in his report to the Medical Research Council and more recently in an account in the Bulletin of Hygiene.

In 1931, a conference of experts convened by the League of Nations recommended that formol toxoids be used in immunisation, and recent years have seen several modifications widely adopted, such as Glenny's toxoid-antitoxin floccules and Ramon's anatoxine. The introduction by Glenny of alum precipitated toxoid promised the arrival of the ideal method, namely, immunisation of high degree and permanence with a single injection. However, the reports of the last year suggest that this ideal has not been entirely attained. The consensus of opinion is that two or three spaced injections are still preferable, even with the alum precipitate preparation, while Williams, Dear, Stewart and Fitzgerald last year claimed that the one dose method is still uncertain and that generally, as judged by Schick testing, the alum precipitate is for general purposes not as valuable as T.A.F. (toxoid-antitoxin floccules) or T.A.M. (toxoid-antitoxin mixture).

An administrative point of some importance is the question of the necessity of Schick testing. A preliminary Schick test is of doubtful practical value in school children and may damage the popular success of an immunising campaign. The intradermal injection necessary for the Schick test may be painful, and by increasing the number of injections may add to the difficulties of completing the procedure. As for all practical purposes the majority of young children may be considered Schick positive, many authorities omit the test and undertake immunisation of all children.

Another problem is created in regard to a Schick test carried out subsequent to immunisation. Nash and Panes this year state emphatically that " to dispense with this very necessary procedure will invariably bring an immunising scheme into disrepute, besides putting a small percentage of children who fail to acquire immunity into a position of false security ".

Throughout the world mass protection of children, both of school and pre-school ages, is being actively undertaken, and it is opportune to consider whether in this country a more general campaign is required. As a disease standing high in the scale of infectious diseases, diphtheria is of considerable importance in South Africa. For the year ending June, 1937, nearly two thousand cases were reported, while the latest available index of mortality is the crude death-rate for 1935 which was 3·95 per 100,000. This figure does not represent one of the major causes of death, but it is nevertheless significant.

The deaths from diphtheria are sufficiently numerous in the Union to deserve serious consideration, particularly when it is remembered that they are almost entirely preventable. Young lives are the most valuable to the State and every effort is called for in their preservation. A more vigorous attempt to increase the numbers immunised against diphtheria is demanded and the Department considers that local authorities and the responsible educational and child welfare authorities should make widely known and provide the means for this most valuable and harmless application of preventive medicine. A valuable lead has been given by Capetown where Professor T. Shadick Higgins has been operating a scheme for several years, and has established the practicability of the procedure in this country. The South African Institute for Medical Research, too, has been an active protagonist of diphtheria immunisation and the work of Grasset has done much to popularise the toxoid preparation known as anatoxine.

The need exists, the materials are available, and the practicability of diphtheritic immunisation has been proved in South Africa, and now there only remains the effort needed on the part of administrative bodies to secure its widespread adoption. To induce local authorities to make such an effort it will probably be necessary to amend the law and to make the expenditure refundable in terms of the Public Health Act.

4. *Enteric or Typhoid Fever.*—The notifications for the past ten years (for twelve-month periods ending 30th June) were as follows:—

1928	5,787 cases.
1929	4,963 ,,
1930	3,775 ,,
1931	4,793 ,,
1932	4,505 ,,
1933	4,389 ,,
1934	8,267 ,,
1935	4,377 ,,
1936	4,384 ,,
1937	4,205 ,,

As in previous years, it must be indicated that as notifications of infectious disease are very incomplete, especially for the non-European populations, the above figures are not a true reflection of the amount of enteric occurring in the country. In spite of persistent teaching by this Department that carelessness in regard to sanitation and lack of personal hygiene are the causes of this disease, it continues to be prevalent. Local communities are visited at intervals by inspecting officers, who invariably emphasise the necessity for scrupulous supervision of sanitary services, milk and water supplies, and animal control. This practice does not always have the desired result and it is regrettable to report that the continued large number of enteric cases in the smaller local authority areas is but evidence of a low standard of sanitation and hygiene. There still exist councils which resist efforts to replace the single pail with the double pail night-soil removal system, which dump night soil into large open pits, which make no attempt to take action against owners of dirty, manure-littered dairy premises, which tolerate filthy private slaughterpoles, and which are unmoved by the annual plague of flies. Recently the Department has found it necessary to make more urgent representations to several such local authorities, which, in spite of recommendations made by health officers, have been disinclined to improve local sanitary conditions. Such communities do not appreciate sufficiently the association between filth, flies and such diseases as enteric, dysentery, infantile diarrhoea and gastro-enteritis. Throughout the country there is a need for higher standards of sanitation, cleanliness and personal hygiene. This must be met by education and propaganda. Education is coming increasingly to the forefront of health activities, and, as indicated in another section of this report, the Department is now actively exploring avenues to expand and accelerate this important development.

A higher personal standard of hygiene would result in local authorities incurring expenditure for the improvement of local sanitary conditions, and, with the removal of sources of pollution of food and drink, would disappear to a large extent the causes of enteric and the other gastro-intestinal conditions.

That expert health and sanitary officers play a significant part in this field is fully borne out by Table G (ii). As an illustration, the smaller Reef municipalities may be taken. These areas have recently appointed full-time medical officers of health and almost certainly the drop in incidence compared with previous years seen in the table is directly attributable to the influence these officers are exerting on their communities.

The distribution of the cases reported during the year is shown in Table G (i).

TABLE G (i).—ENTERIC OR TYPHOID FEVER: CASES REPORTED DURING THE YEAR ENDED 30TH JUNE, 1937.

	EUROPEAN.	NON-EUROPEAN.
Cape Province (excluding Transkei)	472	744
Transkei	9	131
Natal	88	319
Orange Free State	136	311
Transvaal	468	1,527
TOTAL	1,173	3,032

Sporadic cases of typhoid occurred generally in Natal throughout the year. The largest numbers of positive Widals were recorded in August, October and November, 1936, and January, March and April, 1937; the total of positive Widals for the year amounting to 303.

Practically every urban and rural local authority notified one or more cases during this period.

The following are the notifications of enteric received by the Deputy Chief Health Officer, Natal:—

Urban local authorities 99
Rural areas 283

The four largest outbreaks occurred in February-April: One at Mooi River—14 cases; one at Esenembe, Stanger district—6 cases in one family; and two in the Estcourt district. The position is not regarded as satisfactory, but there has been a steady improvement in both urban and rural sanitation and water supplies and an increasing exhibition of prophylactic inoculation against enteric.

As in previous reports, the incidence of typhoid in certain local authorities is tabulated [Table G (ii)]. Again attention must be directed to the fact that local authorities high up on this list have this eloquent testimony of the results of imperfect hygienic procedures in their areas.

TABLE G (ii).—ENTERIC OR TYPHOID FEVER—NOTIFICATIONS AND INCIDENCE IN CERTAIN LOCAL AUTHORITY AREAS DURING THE YEAD ENDED 30TH JUNE, 1937 (ARRANGED IN ORDER OF INCIDENCE RATE)–EXCLUDING CASES RETURNED AS "IMPORTED".

Local Authority.	Notifications.			Incidence per 1,000 of Population.		
	European.	Non-European.	Total.	European.	Non-European.	All Races.
Merweville.....V.M.B.	9	6	15	26·01	28·99	27·12
Calitzdorp.....M.	15	16	31	12·58	19·97	15·55
Alice.....M.	6	37	43	8·02	16·69	14·50
Alexandra.....H.C.	—	178	178	—	10·62	10·62
Jansenville.....M.	1	17	18	1·33	15·48	9·74
Umtata.....M.	—	38	38	—	11·91	6·87
Clanwilliam.....M.	3	7	10	5·51	7·58	6·81
Nigel.....M.	7	137	144	1·71	7·77	6·63
Empangeni.....Tn. Bd.	2	10	12	2·84	6·87	5·56
Verulam.....Tn. Bd.	—	10	10	—	6·08	5·32
Springs.....M.	18	439	457	0·98	6·42	5·27
Kroonstad.....M.	15	51	66	2·81	6·15	4·84
Heilbron.....M.	3	16	19	1·94	5·52	4·75
Bethulie.....M.	8	4	12	5·51	2·21	3·67
Beaufort West.....M.	10	12	22	2·86	2·72	2·76
Middelburg (Cape).....M.	5	9	14	2·37	2·79	2·62
Ficksburg.....M.	12	1	13	4·79	0·38	2·53
Grahamstown.....M.	8	42	50	0·98	3·63	2·53
Ladybrand.....M.	5	7	12	2·17	2·87	2·53
Volksrust.....M.	8	4	12	2·67	2·23	2·50
Burghersdorp.....M.	2	10	12	0·97	3·58	2·46
Cradock.....M.	9	10	19	2·44	1·79	2·05
Southern Umlazi L.A. & H.Bd.	3	8	11	1·42	2·34	1·98
Randfontein.....M.	—	56	56	—	2·38	1·95
Klerksdorp.....M.	13	4	17	2·85	0·91	1·90
Middelburg (Tvl.).....M.	7	4	11	2·41	1·39	1·90
Krugersdorp.....M.	9	82	91	0·50	2·23	1·66
Graaff-Reinet.....M.	5	14	19	1·12	1·86	1·59
Vereeniging.....M.	8	22	30	1·69	1·56	1·59
Boksburg.....M.	32	47	79	2·01	1·37	1·58
Queenstown.....M.	6	20	26	0·89	1·73	1·42
Bethlehem.....M.	5	8	13	1·00	1·49	1·25
Harrismith.....M.	9	2	11	2·87	0·33	1·19
Stellenbosch.....M.	7	3	10	1·40	0·79	1·14
Roodepoort-Maraisburg...M.	8	36	44	0·75	1·17	1·06
Uitenhage.....M.	10	11	21	1·06	0·99	1·02
Bloemfontein.....M.	19	24	43	0·79	0·84	0·82
Germiston.....M.	12	43	55	0·47	1·02	0·81
Benoni.....M.	12	55	67	0·57	0·87	0·80
Brakpan.....M.	7	26	33	0·40	0·70	0·60
Capetown.....M.	51	121	172	0·34	0·84	0·58
Port Elizabeth.....M.	25	28	53	0·52	0·56	0·54
Johannesburg.....M.	118	120	238	0·47	0·58	0·50
Pretoria.....M.	23	29	52	0·34	0·73	0·48
Pietermaritzburg.....M.	5	16	21	0·23	0·62	0·44
Durban.....M.	24	67	91	0·17	0·44	0·38
East London.....M.	5	7	12	0·23	0·28	0·26

M.= Municipality. Tn. Bd.= Town Board. H.C.= Health Committee.
V.M.B.=Village Management Board. L.A. & H.B=Local Administration and Health Board.

5. *Leprosy.*—The numbers of lepers in the five institutions remain approximately the same as last year. These are shown in Table H (i).

TABLE H (i).—LEPER INSTITUTIONS: PATIENTS THEREIN ON 30TH JUNE, 1937.

Institution.	Europeans.		Native.		Mixed Coloured.		Asiatic.		TOTAL.		
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	Persons.
Pretoria.....	66	32	429	243	63	33	3	3	561	311	872
Mkambati.....	—	—	141	96	—	—	—	—	141	96	237
Emjanyana.....	—	—	353	312	—	—	—	—	353	312	665
Amatikulu.....	—	—	252	162	—	—	—	—	252	162	414
Bochem.....	—	—	45	36	—	1	—	—	45	37	82
TOTAL.....	66	32	1,220	849	63	34	3	3	1,352	918	2,270

There is again a slight decrease in the number of European lepers under treatment, the numbers having dropped from 104 to 98. As the persistence of leprosy in a community depends largely on malnutrition and insanitation, associated with financial stringency and low social status, the complete elimination of this disease from the European section of the population is a goal which is no longer out of sight. The same cannot, unfortunately, be said as yet of our very backward Native population. A satisfactory feature to be noted, however, is the increasing numbers of Native patients who report voluntarily and the increasingly early age at which they report. The more effective removal of patients from their homes which is now the case must in time cause a decrease in the incidence of the disease. A more rapid advance, however, cannot be expected until there is a general improvement in the living conditions of these people. The provision of more protective foods and the removal of the insanitary conditions under which so many live are the only real effective measures in combating the disease.

In Table H (ii) are shown the numbers of recognised lepers not institutionalized. These include 5 who have been authorised to be segregated in their own homes, and 27 who, though certified as lepers, were on the 30th June awaiting transport to an institution.

There is often a little delay in arranging for transport owing to the precautions that have to be taken on the railway. A special leprosy coach has to be sent out to fetch the cases certified; there is necessarily only a limited number of these coaches. The remaining cases shown in this table are those which have been released from the institutions having been certified by the Leprosy Board to the effect that they are no longer infectious.

TABLE H (ii).—LEPROSY: CASES REMAINING IN THEIR OWN HOMES ON 30TH JUNE, 1937.

	Certified and Awaiting Removal to Leper Institution.	Home Segregated.	Probationally Discharged from Leper Institutions.		Total.
			Still under Surveillance.	Released from Surveillance.	
Cape (Province proper).....	2	2	152	417	573
Transkei.....	17	2	600	745	1,364
Transvaal.....	3	1	561	601	1,166
Natal.....	4	—	312	512	828
Orange Free State.....	1	—	103	141	245
UNION.....	27	5	1,728	2,416	4,176

In the treatment of leprosy main reliance is still placed in chaulmoogra oil and its ethyl-esters. Although these cannot be looked upon as specifics against leprosy, yet the number of cases showing improvement or arrest under their administration, outnumber those who do so spontaneously or under other forms of treatment. All new drugs which are reported elsewhere as giving any promise of success are tested at our institutions, but up to now invariably with disappointing results. This also appears to be the general experience of institutions in other parts of the world. Chaulmoogra oil and its derivatives still hold the place of honour among drugs in our armamentarium against leprosy.

6. *Malaria.*—A. *Control in Natal and Zululand.*—The climatic conditions in respect of rainfall, temperature and humidity were peculiarly favourable for the propagation of malaria vectors during the season under review. The rainfall throughout the province was above the average and was characterised by heavy storms with intermittent spells of hot humid weather which lasted longer than usual and continued into late May. The early spring rains, however, had been responsible for flooding and maintaining a

constant flow of water in all the larger rivers, resulting in a strong growth of vegetation in the early summer which to a large extent retarded the breeding of *A. gambiae*, the chief malaria vector in this Province.

Dry weather set in at the beginning of March when receding rivers left numerous pools and dying vegetation exposed seepages, making conditions ideal for the multiplication of *A. gambiae* over a wide area.

The incidence of malaria up to the end of March had been confined to sporadic cases throughout the Province. With a continuation of dry weather in April, vector breeding increased rapidly in all uncontrolled areas and more particularly along the valleys of the Tugela, Umfolosi, Mkuzi and Pongola Rivers, and later spread to the uplands in the northern districts of Natal.

The incidence of malaria followed in the wake of vector breeding and by the end of April the disease was prevalent and more widespread throughout the northern districts of Ngotshe, Vryheid and Paulpietersburg than it had been since the epidemic year of 1933. In addition localised outbreaks occurred in the districts of Nqutu and Utrecht and sporadic cases in the Newcastle district.

In contrast to these uncontrolled areas, the position on the coastal belt of Natal and Zululand where statutory control in the form of malaria committees has been established and where climatic conditions were no less favourable for the propagation of malaria, the incidence of the disease was negligible in all but one area in Zululand.

In this malaria committee area in Zululand where, prior to the beginning of March no *A. gambiae* had been located, an outbreak of the disease occurred at the beginning of April. Investigations revealed a decided slackness on the part of certain property owners in the carrying out of anti-adult control measures and showed a heavy infestation of *A. gambiae* in their Native quarters. This neglect of control resulted in an outbreak of malaria involving 32 cases, of which 6 were Europeans. It was not until the end of April when emergency measures had been instituted by the committee that the outbreak was brought under control.

The suddenness with which the incidence of malaria increased in this area was typical of its occurrence in the uncontrolled areas during the present season, and emphasises most forcibly the necessity for continual supervision and unrelaxed control during the summer and autumn months even though conditions may appear to be satisfactory.

The following table shows the number of positive blood smears examined in the laboratory at Durban since August, 1931:—

Season.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.	June.
1931–32....	—	15	14	24	20	40	67	159	613	1,334	915	588
1932–33....	178	95	79	96	103	143	225	515	975	1,055	837	404
1933–34....	95	46	33	39	30	37	120	344	826	935	514	237
1934–35....	66	46	35	35	22	33	37	29	38	44	38	3
1935–36....	4	10	4	9	11	5	7	3	59	114	61	40
1936–37....	5	6	2	7	11	6	6	15	16	233	106	38

The various bodies responsible for malaria control in this Province and an approximation of the staff employed is summarised below:—

Authorities.	Staff.		
	Trained.		Untrained Sprayers.
	European.	Native.	Native or Indian.
Urban Local Authorities (38)	52	36	120
Statutory Malaria Committees (18)	26	8	450
Voluntary Malaria Committees (8)	1	8	—
South African Railways	7	—	29
Union Health Department	9	51	64
TOTAL	95	103	663

The control measures during the year under review have been conducted on similar lines as in the past three years.

In local authority areas and in malaria committee areas south of the Tugela anti-larval measures are prosecuted throughout the year but the interval between application of oil is extended during winter months. Anti-adult (i.e. insecticidal) measures are instituted only after adult vectors are located in human habitations.

The improvement in the general sanitation in many local authority areas since the inception of malaria control is worthy of comment. In the more progressive areas a considerable amount of permanent drainage has been effected. Low-lying lands and seepages have been drained and planted with eucalyptus. In this way the annual expenditure on oil and wages has been reduced in some instances by 60 per cent. and the majority of potential breeding spots has been brought within the bounds of effective control.

This progressive policy, however, is still lacking in many areas with the result that the annual expenditure on oil and wages shows little reduction and the dfficulty of maintaining efficient control under adverse climatic conditions is as great as ever.

In malaria committee areas north of the Tugela, anti-larval and anti-adult control measures receive equal attention, the latter being increased or decreased according to the degree of infestation of dwellings and the ability to control breeding.

The Umfolosi Malaria Committee continues to rely on anti-adult control by thrice weekly spraying of all dwellings and barrack-rooms in the area and, even under the most adverse climatic conditions obtaining during the past season, only a few sporadic cases of malaria have occurred in the area.

Voluntary committees, which include the smaller settlements and groups composed of contiguous farms mainly in the inland and northern districts of Natal, rely chiefly on anti-adult measures. As these committees were established mainly in epidemic areas, there has been great difficulty in keeping them fuctioning in the absence of active fever during the past two years. Thus in the northern districts when cases of fever appeared in April, it was found that owing to lack of co-operation between adjoining farmers in areas in which this system had been attempted last year, control reverted to individual effort on the part of the more progressive elements only.

The control of malaria, in the inland districts, where mixed farming, i.e. agricultural and cattle, is carried on, presents greater difficulties than in the coastal areas or in the wattle belt where labour, mostly adult, is grouped in barracks. In these districts the conditions resemble the Native areas, in that the Natives live in scattered kraals with their families. The labour actually employed by the farmer at any given time represents only a small proportion of the total Natives living on his farm and the possibility of getting farmers to administer treatment to sick, or to undertake anti-adult control by spraying all huts on their farms is very remote. This neglect of treatment and control measures in affected sections results in a high parasite carrier rate among the farm Natives in these areas and no doubt accounts for the widespread infection among Europeans and Natives during the past season. Another factor which operated was the interchange of labour between the labour farms in the Mkuzi, Pongola and Umfolosi Valleys and the European-occupied farms on the uplands. This was borne out by investigation into local outbreaks in the Utrecht district, where on one farm no fewer than six cases were traced to the introduction of fresh labour from a labour farm in the Pongola Valley.

The grouping of kraals in selected sites on the farm, earlier and better treatment of cases, plus disinfestation of infected kraals, and a restriction in the interchange of labour from labour farms in malarious valleys during the summer months, is advocated as being practical and necessary for control and prevention of the spread of malaria infection under the present circumstances.

In the *Native Reserves* which fall under the Department the sytem of control adopted three years ago has been successfully continued.

This involves the stationing of trained Native malaria assistants who initiate treatment and act as " spotters ", in all sections known to favour *A. gambiae* breeding. During the winter months the " spotter " deals with any focus of breeding located and follows up treatment of relapse cases. Immediately the infestation of huts by adult mosquitoes gets beyond the control of the " spotters ", local labour is employed and a systematic weekly hut spraying to cover the affected section is applied.

On the coast, south of the Umfolosi, it was found necessary to continue this systematic control throughout the year in certain sections of the Lower Umfolosi, Mtunzini, Eshowe, and in the Mnini Trust area in the Pinetown district. The latter area owing to its extensive " flats ", its clay soil, and the large numbers of grazing cattle, is the most prolific *A. gambiae* focus in Natal, and is also one of the most difficult to control.

In the inland valleys of the Umvoti and the Tugela it became necessary to introduce systematic control in certain sections towards the end of April, when as a result of the subsidence of these rivers, favourable breeding conditions for *A. gambiae* occurred with a resultant infestation of huts along the banks.

On the Zululand coast north of the Umfolosi the problem of control is no small one. Here the epidemic areas to the west merge with the endemic coastal flats. Favourable climatic conditions for vector breeding invariably result in an overflow of infection from endemic to epidemic regions. The effect of this may reveal itself to a negligible extent in the malaria tolerant Natives but it becomes very apparent in those non-tolerant Natives who live on the border line.

The policy of the Department based on the advice of Professor Swellengrebel has been not to interfere with the malaria tolerant population in endemic areas. In such areas the policy has been to prevent the spread of infection westwards into the susceptible population.

The past season has provided a test of the ability to counteract this westward spread and although it has not met with complete success, the control measures which have been introduced under the most difficult conditions have certainly met with an encouraging measure of success, as shown by the fact that the incidence and severity of malaria on the farms further inland to the west have been relatively higher than in the controlled Native areas bordering on the endemic areas.

Towards the close of the season 22,000 huts had been brought under systematic weekly spraying in the Native Reserves.

The materials used during the season amounted to 4,748 gallons of insecticide and 5,560 gallons of anti-malaria oil. In addition 828 pumps were sold to Natives who received a free weekly issue of insecticide and undertook spraying on their own behalf.

The organisation and supervision of the measures employed fall under the Department's European inspectors who are stationed at the following centres: Umkomaas, Durban, Stanger, Eshowe, Empangeni, Mtubatuba, Nongoma, Vryheid and Greytown. During the year the European staff carried out the following inspections:—

Local authorities	250
Malaria committees	196
Voluntary groups	64
Farms and estates	755
Native Reserves	813

The trained Native staff is posted to the European inspectors according to the extent of control necessary in the respective areas. The sprayers employed are recruited from the local Native population. During the year under review Native malaria assistants visited 206,986 Natives in Reserves, including 2,500 sick, and distributed 850,000 tablets of quinine.

The policy of establishing eucalyptus trees initiated two years ago by the Native Affairs Department, as a permanent means of drying out waterlogged sections in the coastal Native Reserves, has been continued and during the year a further 70 acres have been planted in the Eshowe, Mtunzini and Lower Tugela districts. Arrangements are in hand for an extension of these permanent measures to embrace sections in Lower Umfolosi, Pinetown and Umzinto districts.

It is pleasing to be able to report that the hostility of the Natives to these permanent control measures is steadily diminishing. It has been demonstrated to them that only swampy areas are being fenced and planted and that the scheme has not been designed to deprive them of their land as it was at first suspected.

The closest co-operation has been maintained between the departmental and inspectorate staffs of the numerous entities comprising the anti-malaria organisation in this Province. Departmental inspectors act as liaison officers between the contiguous authorities, and monthly meetings are held at which difficulties with regard to control are discussed and mutual arrangements for overcoming these are devised.

Close contact has been maintained with the malaria research station at Eshowe and collections of adult vectors have been submitted for dissection. The infectivity rate thus shown is used as a means of determining the necessity for instituting systematic control in any given area.

B. *Tzaneen Field Station.*—The staff attached to this station consists of—

(*a*) a medical inspector (malaria);
(*b*) four health inspectors;
(*c*) four lady health visitors;
(*d*) two technical assistants in the laboratory at Tzaneen; and
(*e*) five Native " spotters ".

When the station was first established it was not found practicable to deal with areas apart from those which were known to be annually intensely stricken with malaria. These comprised the tract of country north of the Zoutpansberg Range and the Waterberg and Koedoesrand regions. The first extension occurred with the placing of a health inspector in the lowveld regions of the Eastern Transvaal around Barberton, Nelspruit and Komatipoort. Supervision from this centre was then extended to the adjacent areas of Lydenburg, Steelpoort and Middelburg, while the outbreak of an epidemic to the north-west of Pietersburg necessitated attention being given to this area. A lady health visitor was accordingly placed at Zoetdoorns and periodic visits were made to this district by a health inspector.

These developments have now covered the major portion of the malarial districts of the Transvaal, *viz.*, the entire northern, north-eastern and north-western sections. Still requiring supervision are the areas of Piet Retief —in which is situated the Bergvlei endemic region—and Rustenburg-Zeerust in the west. In regard to Piet Retief it is proposed to appoint a fifth health inspector, who will also link up the Natal and Transvaal malarial organisations.

The duties of the staff operating in this large area may be briefly summarised as follows:—

The Medical Inspector, with headquarters at Tzaneen, is in charge of the organisation and supervises both field and laboratory activities. He visits local authorities, industrial and other concerns, inspects their arrangements and generally advises on their respective programmes. Through contact with district surgeons and medical practitioners he is enabled to secure co-operation of the medical profession in anti-malarial work, and through frequent lectures and demonstrations he participates actively in the station's propaganda campaign.

The health inspectors, for their respective districts, act as observers of the malarial situation and as advisers of local anti-malarial measures. The two malarial vectors, *A. funestus* and *A. gambiae*, are carefully watched and all behaviour phenomena reported to the Tzaneen station; in this manner malarial activity is foreseen, while field and laboratory research are correlated.

During the off-season, and when not assisting in laboratory or other routine work, these officers under the supervision of the Medical Inspector undertake systematic inspections of sanitary and general health conditions in the local authority and municipal areas of their districts.

Lady health visitors, who have been placed at strategic points, visit the families of the district periodically, educating and instructing them in:—

(*a*) malaria prevention;
(*b*) adequate and suitable diets;
(*c*) home nursing and domestic hygiene;
(*d*) child welfare and mothercraft;
(*e*) first aid and ante-natal care.

A clinic is associated with each health visitor, and every effort is being made to centre a definite preventive unit in each of these workers. Such clinics now exist at Alldays, Swartwater, Mokeetsi and Zoetdoorns, and are conveniently situated for the local schools and churches. This arrangement is of great benefit in ensuring the maximum propaganda and health education being achieved, and in providing useful depôts for the distribution of quinine and other supplies in epidemics.

The two techincal assistants are stationed at the laboratory in Tzaneen, and are responsible for the necessary clerical and laboratory routine.

The five trained Native " spotters " are used both for keeping anophelines under observation and carrying information and instruction into the Native communities.

When the unit commenced operations in 1931 it had to face considerable scepticism and even obstruction from the local rural populations. But no malarial campaign can be successful without the co-operation of the local inhabitants and such co-operation is now being secured. This has been

achieved by holding regular malarial classes for teachers and others at Tzaneen and latterly at Nelspruit. Both Europeans and Natives have received instruction and have seen field demonstrations, and through the continued interest and support of the Transvaal Education Department, it is hoped to extend this powerful means of propaganda. Of considerable importance also have been the actual demonstrations and preventive work carried out on farms and in homes by the health inspectorate, coupled with the distribution of instructive pamphlets in both languages. Recently our pamphlets have been enlarged to meet the growing needs of tourists and visitors who camp in malarious areas, too often regardless of risks they are taking. Similar simple pamphlets are to be issued shortly in the various Native languages.

Lectures, film shows, inspections and demonstrations *in loco* have enabled much to be done in converting the population to a belief in the anti-malarial methods preached by the staff of the unit. Many communities—rural, industrial and mining—have only come to appreciate the need for control when many of their members have contracted the disease during an epidemic. An interesting example of successful preventive work is that of a large citrus concern at Letaba, which employs annually scores of girls from all over the Transvaal. This company, situated in a hyper-endemic area has kept its employees reasonably free from malaria for over four seasons. Last season, on the advice of the Inspector, this concern commenced night packing of oranges in unscreened, but well-lighted sheds. The only additional measure required was the spraying of the legs of the workers with citronella oil. Not a single girl contracted malaria.

Field and entomological research has not as yet been systematically developed, owing largely to the call of more urgent duties. Attention has lately been directed to some of the aspects of *A. gambiae* breeding. Rainfall, sufficient in extent, suitably timed and spaced is, of course, related to multiplication of this vector, and predictions of epidemics are usually based on precipitation figures. Nevertheless, it is not the sole factor, as examination of the records of the last 10-15 years has shown that apparently suitable rain seasons are not invariably followed by increased prevalence.

Some of the other possible factors involved may be appreciated when the following hypothetical case is considered. A year of good evenly spaced rainfall occurs in an epidemic region, creating myriads of suitable breeding places for *A. gambiae*. In the normal course of events the vector population will breed actively and increase considerably in a form of geometrical progression. If now the maximum temperature rises considerably the following possibilities arise:—

(i) The vector population itself may be markedly decreased by high adult mortality, retarding proportionately breeding activity.

(ii) Eggs already laid may be destroyed.

(iii) Assuming that the female mosquitoes are more protected against the heat in so far as the greater majority is sheltered in dwellings, and that the males being less sheltered are exposed to a higher mortality, then some change in fertility is likely to occur.

(iv) The female mosquito may have its fertility directly affected.

Similar influences on breeding are probably to be ascribed to the occurrence of high winds.

Testing of insecticides is proceeding. Examination and dissection of thousands of mosquitoes have not led to the incrimination of any other vectors than *A. gambiae* and *A. funestus*.

Parasitological work occasionally shows apparently atypical strains of the parasite, one at least of which appears to be *P. ovale*. Benign tertian malaria remains as rare as subtertian is common. The station reports an increasing appeal by practitioners for microscopic investigation, while the lay public is also demanding blood smear examinations. The following blood smears were examined during last year:—

	No. of Smears.	*Positives.*	*Negatives.*	*Relapse Cases.*	*Repeat Smears.*
1st July, 1936, to 30th June, 1937..	1,698	1,001	697	21	9

In treatment quinine is still the most important drug and during the last season large issues were made. Both Pietersburg and Potgietersrust districts especially requisitioned large supplies for the epidemic conditions there existing—1,152,200 and 139,115 tablets respectively being issued.

A careful record has been kept of every blackwater case occurring in the lowveld. These cases have shown a reduction in number since the station was established, due probably to such causes as a clearer conception of the relationship on the part of the rural population of malaria and blackwater,

a more careful use of quinine, a more efficient and earlier treatment of every case of malaria, and improvements in after-care and nutrition of the lowveld populations exposed to malaria.

The number of blackwater cases and deaths which occurred in the lowveld as recorded for the last five years is as follows:—

	Cases.	*Deaths.*
1932	24	10
1933	17	2
1934	22	4
1935	9	1
1936	17	7
1937	5	2

Preventive work as practised by the Tzaneen organisation deserves some attention. Anti-larval work is easy against *A. gambiae,* a puddlebreeder, where breeding puddles and pools can be detected, but against *A. funestus* is more difficult and expensive especially in dealing with vegetation at the edges of streams. Anti-adult measures were first adopted in the case of a citrus estate at Letaba. Here, the programme to deal with the larvae of the *A. funestus* being impossible on account of the expense, it was decided to resort to spraying to kill the adults. Very successful results have followed this work during the last four seasons and anti-adult measures are everywhere gaining great popularity, due to easy application relative to anti-larval work, cheapness, obvious success and effect against other undesirable insects as well. With the experience of the last five years considerable improvements have been made in the choice of insecticide and its method of application.

The mosquito net probably remains still one of the most important measures against the adult mosquito, and it is, therefore, regrettable that nets are still often employed which do not conform to the standard of 16 holes to the linear inch. The use of nets and the screening of houses are now receiving widespread acceptance in the lowveld, and the importance of the Rural Farm Owners and "Bywoner" Rehabilitation Scheme is great in achieving suitably protected dwellings for the poorer European classes. Generally, communities in the lowveld are increasingly co-operating in preventive work, while the Kruger National Park authorities are carrying out the recommendations of the Department in protecting tourist traffic.

During the past five years, apart from localised outbreaks, two major epidemics, one in 1936 and the other in 1937, have been experienced in the Transvaal, and a brief review of their main features is of some value.

The first epidemic, that of 1936, was more or less confined to the area extending from north-west of Pietersburg in a narrow belt south of the Zoutpansberg range as far east as the Great North Road. In 1937, the outbreak was much more intense and extended over a much greater area. From the Limpopo in the north-west it swept through to the Pongola in the south-east, involving many areas which had been comparatively malaria-free for ten years. Altogether the epidemic was one of the worst in the Transvaal for many years.

In both years the epidemics had the same seasonal incidence, commencing during the latter part of March and dying down towards the end of May. Examination of rainfall returns of these years with certain other years which were not associated with epidemics, indicates that years with apparently similar rainfall conditions suitable for *A. gambiae* propagation, are not invariably linked with malarial epidemics. *A gambiae* in both epidemics bred actively, the highest numbers in routine catches being recorded in March.

These outbreaks unfortunately caught the local inhabitants unawares with consequent widespread suffering. After-care of these people included distribution of tonic pills through district surgeons and the station inspectorate, and special provincial grants enabled vegetables and fruit to be supplied. In the recent 1937 epidemic a distressing feature was the excessive mortality and morbidity which occurred amongst the Native population. Measures to supply these people with quinine were early established, Native distributors being appointed to visit all kraals.

A problem which is increasingly coming to notice is the so-called end-of-the-season risk. It is very difficult, in fact wellnigh impossible, to determine exactly the duration and extent of a malaria season. The activity of the vector and its relationship to meteorological phenomena form the index. Each year as the incidence of the disease declines and the weather becomes colder, the station is inundated with requests as to when domestic prophylaxis may be discontinued.

Invariably it is the case that with the first indications of colder weather there is a tendency on the part of many to relax preventive measures, often with disastrous results. A sudden cold snap does undeniably affect vector breeding adversely and may also bring about an appreciable reduction in its adult population, yet it is only when and where the minimum temperature is maintained at a very low point of say under 40° F. over a long period of time that a drastic and complete change in the prevalence and risk results.

The short sudden fall of temperature marking the approach of winter is in itself not sufficient to bring about a radical change in the prevalence of the disease. During the past season primary infections of malaria occurred until the middle of June.

C. *Railway Areas.*—A detailed account of anti-malarial measures carried out during the year will be found in the annual report of the South African Railways and Harbours Health Organisation, extracts from which are published as Annexure D to this report.

7. *Plague.*—The incidence of plague was relatively low as will be seen from Table I (i).

TABLE I (i).—PLAGUE CASES AND DEATHS IN THE UNION DURING THE YEAR ENDED 30TH JUNE, 1937.

Province.	Number of Districts in which Outbreaks Occurred.	European.		Coloured or Native.		Total.	
		Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Cape	5	2	1	18	16	20	17
Natal	—	—	—	—	—	—	—
Transvaal	1	1	1	—	—	1	1
Orange Free State	17	6	6	25	13	31	19
UNION	23	9	8	43	29	52	37

There was a total of only 52 cases as compared with 253 the previous year and 290 the year before that. The distribution of these cases over the various districts of the Union is shown in Table I (ii). Most of the cases occurred in the Orange Free State from which Province 31 cases with 22 deaths were reported; of these 6 were among Europeans all of whom died of pneumonic plague in an outbreak which occurred in the Heilbron district. Cases were reported from five districts in the Cape where of 20 persons affected 14 died. The only district in the Transvaal to suffer was Benoni where one European died of the pneumonic form of the disease. This patient had not, however, contracted the disease locally; the infection was imported from Heilbron in the Orange Free State. Natal continues free of human cases though, as will be pointed out, a very great prevalence of the multimammate mouse in the northern portion of that Province is rendering continued freedom from infection very precarious.

TABLE I (ii)—DISTRIBUTION OF HUMAN PLAGUE AMONG THE DISTRICTS OF THE THREE AFFECTED PROVINCES.

Province.	European.		Non-European.	
	Cases.	Deaths.	Cases.	Deaths.
Orange Free State Province.				
Bloemfontein	—	—	2	1
Bothaville	—	—	1	—
Dewetsdorp	—	—	1	1
Edenburg	—	—	2	1
Hauresmith	—	—	1	1
Heilbron	6	6	3	1
Hoopstad	—	—	2	1
Jaeobsdal	—	—	1	1
Jagersfontein	—	—	1	—
Koffiefontein	—	—	1	—
Kroonstad	—	—	2	—
Lindley	—	—	1	—
Philippolis	—	—	1	1
Rouxville	—	—	2	2
Thaba N'ehu	—	—	1	—
Wepener	—	—	2	2
Winburg	—	—	1	1
17 DISTRICTS	6	6	25	13
Cape Province.				
Beaufort West	1	1	1	1
Hay	—	—	3	2
Middelburg	—	—	8	8
Uitenhage	1	—	1	1
Willowmore	—	—	5	4
5 DISTRICTS	2	1	18	16
Transvaal Province.				
Benoni	1	1	—	—
1 DISTRICT	1	1	—	—

The incidence of plague in the Union during the past 16 years is shown in Table I (iii). It will be seen to fluctuate very considerably, bad years following frequently after very good years. Thus the worst year, 1924, with 372 cases, followed one in which only two were reported. The close relationship of veld rodent prevalence and the high incidence of plague in man soon after such prevalence has become evident, has been repeatedly pointed out. The great prevalence of rodents in Zululand will, therefore, require very careful handling if the danger of a severe outbreak of human plague is to be avoided.

TABLE I (iii)—HUMAN PLAGUE CASES AND DEATHS REPORTED DURING THE PAST 16 YEARS.

Year ended 30th June.	Number of Cases.	Number of Deaths.
1922	42	23
1923	2	1
1924	372	235
1925	112	68
1926	71	46
1927	75	56
1928	39	31
1929	65	42
1930	145	89
1931	71	44
1932	22	16
1933	31	16
1934	39	29
1935	290	184
1936	253	165
1937	52	17

Similar heavy infestations with rodents are remembered by old residents in Northern Zululand. They occurred according to such observers in 1917, 1924, 1929 and 1933. These visitations seemed to have occurred invariably following very wet seasons when the grass of the veld was growing very luxuriantly. The seasonal rainfall in this region during recent years was as follows:—

1926-27	12·67	inches.
1927-28	23·86	,,
1928-29	22·53	,,
1929-30	26·95	,,
1930-31	13·88	,,
1931-32	21·13	,,
1932-33	21·27	,,
1933-34	26·87	,,
1934-35	15·69	,,
1935-36	18·78	,,
1936-37	25·07	,,

On none of the previous occasions, however, does the rodent population appear to have reached the tremendous proportions of the season under review. The position was investigated on behalf of the Department by Dr. L. Fourie, Senior Assistant Health Officer. He found that the species of rodent present in greatest numbers was the multimammate mouse, *Mastomys coucha*, though other local species such as Leggada (dwarf mice) were found also to have increased greatly in numbers.

The phenomenal increase in the numbers of rodents was first noticed by local residents early in April, 1937. For example, about the middle of that month a cat with a litter of young brought 24, 32 and 37 multimammates on three successive nights on to the verandah on which the kittens were kept. About the same time ravages by rodents began to appear among the cotton and other crops in the fields as well as among the stored seeds and cereals and numbers of mice were noticed to collect under galvanised iron sheets and other objects outside the store at the Experimental Station of the Empire Cotton Growers' Association. On the 29th May, 55 *M. coucha* were killed under the corrugated iron sheets and 30 on the following day. Over 300 were also destroyed in three stooks of mealies. These statements were confirmed without difficulty by Dr. Fourie and his assistants. On one day they gassed over 60 under the same sheets and within a few days some 40 to 50 had again collected underneath them. In two rooms of the store 137 multimammates were gassed, while many escaped into the foundations. At night a continuous rustle was to be heard among the dried leaves and vegetation in the fields and around the outbuildings and by the light of a hand torch mice were to be seen in all directions in their thousands. Within a very short time they managed to kill 30 of them by means of sticks. In one burrow 74 were gassed. Quite ninety per cent. of the animals gassed and seen out at night were young

and not more than three months of age. Around their camp at Magut animals of about the same age could also be heard and seen in numbers among stones and boulders at and shortly after daybreak.

Evidence of a similar prevalence of multimamate mice was obtained over a very large area; both Europeans and Natives stated that these rodents were present in unusually large numbers and had been causing much damage lately. That the present cycle is due to prolific breeding during the last few seasons, especially during the latter half of the past season, and not to migration, leaves no room for doubt.

Though some evidence of an increasing mortality rate was found, this certainly showed no signs of reaching epizootic proportions. It is possible that the mortality observed represents the pre-epizootic stage. In that case they may be dying in very large numbers shortly. Our past experience in the Union makes it extremely improbable that the present excess in numbers will be maintained for any length of time without the appearance of an epizootic of some kind. The position is, therefore, being kept under very careful observation. As multimammate mice do well in captivity several hundreds have been captured. To these captives new specimens from the field are being added from time to time to ascertain whether any infection that may meanwhile have arrived can be introduced. This procedure in addition to the search for evidence of mortality in the field should give us timely warning of the approach of an epizootic.

The inspector left by Dr. Fourie in charge of the precautionary measures in the Magut area carried on active propaganda. In consultation with farmers' associations he arranged to give lectures on plague and demonstrations on measures for destroying rodents. Wheat and other baits such as monkey-nuts poisoned with strychnine and barium carbonate gave excellent results. Tens of thousands of rodents were killed in the neighbourhood of Magut by these means.

Evidence of " swarming " of rodents in other parts of the country during the past season has also been forthcoming. On the 27th of May the Chief Rodent Officer of the Department found that on the Johannesburg-Potchefstroom road between the eighth and ninth mile-stones a very large number of gerbilles and multimammate mice had been run over by motor-cars. Apart from these deaths caused by traffic the rodents in the area appeared to be healthy, since members of the rodent staff of the Johannesburg Municipality who dug up burrows in the vicinity could find no dead bodies. Evidence of an impending epizootic was, however, furnished by material obtained from one of the rodents which had been run over. This material was used for inoculating captive gerbilles which the Chief Rodent Officer was carrying on his van. The captive rodents inoculated by scarification on the 28th May died on the 30th May and 1st June. Bacteriological examination of one of these animals showed the infection to be Tiger River disease. This disease has frequently been found in South Africa to cause extensive mortality among rodents. It does not, however, set up such rapidly spreading epizootics as does plague infection.

8. *Rabies or Hydrophobia.*—During the year 25 persons were bitten by rabid animals. Only one of these, an adult Native woman, subsequently died of rabies, as the case was not reported at the time of the bite but only when symptoms of the disease had already appeared. All the other cases received prophylactic treatment in good time. This consisted in most cases of a series of daily injections with antirabic vaccine.

The biting animals were yellow mongooses (3 persons), genet cats (4 persons), domestic cats (8 persons), dogs (10 persons). Wherever practicable the rabid condition of the animal was confirmed by histological and biological tests.

Attention must again be drawn to the danger of interfering with sick carnivorous animals. Children in the veld are often tempted to chase after the small animals when they obviously are unable to run rapidly.

This Department, jointly, with the Director of Veterinary Services, has prepared a detailed pamphlet on rabies. In this pamphlet, full information is given of the occurrence of the disease with descriptions and pictures of the wild animals known to be carriers of infection, mode of transmission, symptoms, diagnosis, the procedure for collection of material for laboratory tests, preventive measures and treatment. It is intended primarily for the information of magistrates, district surgeons, veterinary officers and local authorities. It should prove valuable also to teachers and others in authority who are in a position to warn persons of the danger of infection and the precautionary measures which should be adopted.

9. *Smallpox.*—The cases of smallpox occurring in the Union continue in general to be of a very mild nature; among twenty-seven reported only one proved fatal. The cases were entirely confined to the non-European population. Vaccination is always carried out among all immediate, remote and possible contacts of any case of the disease reported.

TABLE J.—SMALLPOX: CASES AND DEATHS REPORTED DURING THE YEAR ENDED 30TH JUNE, 1937.

Province.	Number of Districts in which Outbreaks Occurred.	European.		Non-European.		Total.	
		Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Cape	2	—	—	6	—	6	—
Natal	—	—	—	—	—	—	—
Orange Free State	4	—	—	10	1	10	1
Transvaal	4	—	—	11	—	11	—
UNION	10	—	—	27	1	27	1

Legislation in regard to vaccination is actively enforced. Tables summarizing this work will be found in Annexure E at the end of this report.

Experiments are being conducted at the Rosebank Vaccine Institute regarding the growing of vaccinia virus on fertilized poultry egg medium. If these experiments prove successful it is hoped that in the relatively near future this virus may entirely replace the calf virus used hitherto.

10. *Tuberculosis.*—The general public is becoming increasingly aware of the prevalence of tuberculosis in the Union. Thus at a meeting of the National Council of Women of South Africa in June, 1937, the following resolution was passed:—

> "That, being most seriously concerned over the increase of tuberculosis in South Africa, due to the malnutrition among Natives, we, the National Council of Women of South Africa, urge that—
>
> (*a*) in view of the success of the cheap sugar scheme, means be explored for ensuring adequate supplies of all essential foodstuffs such as milk, butter, eggs, and fresh fruit, at prices within the purchasing power of our Natives and lesser paid population;
>
> (*b*) that the authorities concerned be urged to extend the scheme of free milk supply so as to include Native children."

In the Department's annual report for the year ended June, 1933, a review was given of the history of tuberculosis in South Africa. Since 1933 very considerable progress has been made in providing hospital and sanatorium beds in the Union of South Africa.

In the *Transvaal* arrangements have been made with the Chamber of Mines to take non-miners and women into Springkell Sanatorium.

At the 30th June, 1937, this institution had 124 patients:—

European males, miners	48
European males, non-miners	47
European females	29
	124

The institution is equipped with an x-ray plant.

A suitable building has been erected at the Rietfontein Hospital to deal with cases of non-European tuberculosis. To begin with many of the patients were in a very advanced stage of the disease, but earlier cases are now coming forward.

Beds in Tempe Hospital, Bloemfontein, are used to serve the *Orange Free State.* These are for both Europeans and non-Europeans.

In *Natal* the new Tuberculosis Hospital at Springfield, Durban, is nearing completion. This hospital of 139 beds will cater for all races. It will be equipped on modern lines complete with operating theatre for the surgical treatment of pulmonary tuberculosis.

At Nelspoort Sanatorium in the Cape Province a new block of 32 beds for Europeans was opened during the year and a new block for 36 non-Europeans is now in course of erection. This sanatorium has been developed on the lines laid down in 1924, and the increasing demand for admission of cases demonstrates that the value of the institution is becoming more and more appreciated throughout the Union. Although it has been repeatedly pointed out that Nelspoort is intended for the early curable cases, yet in the past owing to lack of accommodation for the acute and advanced cases, many unsuitable cases had to be admitted. Even in the past year approximately 30 per cent. of the patients admitted were Stage III or advanced cases. The result of the admission of such a number of advanced cases is that early suitable cases are often kept waiting for admission and when they are admitted

the disease has progressed. The acute case should not be sent on a long train journey, but should be isolated and treated near his home until the acute symptoms have subsided. Considerable progress has been made in providing such facilities in the larger coastal towns.

Thus in 1933 there were only 54 beds available in the City Hospital at Capetown, for cases of tuberculosis. To-day there are 126 beds of which 42 are for European cases and 84 for non-Europeans. Accommodation for another 42 beds is now under construction and will be available for Europeans in the near future. At Stellenbosch beds are now available in the recently erected Infectious Diseases Hospital for a limited number of cases of pulmonary tuberculosis. A new Infectious Diseases Hospital is in course of erection at Port Elizabeth in which 72 beds are to be provided for tuberculosis patients. At East London a few beds are already available for cases of pulmonary tuberculosis in the Infectious Diseases Hospital and representations have been made to the Council for the erection of a special tuberculosis block at that hospital, providing 50 beds for non-Europeans. At Sulenkama in the Qumbu district of the Transkei a private donation of £1,000 to which the Government is adding the sum of £2,500 has rendered it possible to erect a 20 bedded annexe for tuberculosis cases to the Nessie Knight Hospital of the Church of Scotland Medical Mission.

Additional accommodation has also been provided for non-Europeans at other mission hospitals. Arrangements have been made to attach to the Victoria Hospital, Lovedale, beds for 90 cases of tuberculosis, and at Umtata for 30 cases. At the Holy Cross Mission Hospital in the district of Flagstaff, Pondoland, beds are also available.

It will be seen, therefore, that during the past three years there has been very considerable expansion in anti-tuberculosis work. The development so far has been mainly in the provision of sanatorium and hospital beds, so that facilities for isolation and early treatment are much improved. In calculating the number of beds required various bases have been employed from time to time. In Great Britain the Departmental Committee on Tuberculosis (The Astor Committee) in 1912 advised one sanatorium bed and one hospital bed per 5,000 of the population. This number took no cognisance of the number of cases and later the Inter-Departmental Commtitee on Residential Treatment for Discharged Soldiers and Sailors reported that under the Astor Scheme the number of beds was insufficient. The Society of Medical Officers of Health reported to the Ministery of Health Departmental Committee in July, 1934, that the number of beds required should be based on the number of deaths annually, and suggested 75 beds per 100 deaths. In many places overseas this proportion is exceeded. For instance for England and Wales as a whole there are 87·4 beds per 100 annual deaths from pulmonary tuberculosis, and if all forms of tuberculosis are included 71·7 per 100 deaths.

In some of the continental towns the proportion is also high. Thus in Copenhagen where there are annually 478 deaths there are 450 hospital and 170 sanatorium beds. In Stockholm with 563 deaths from all forms of tuberculosis there are 944 beds.

At present the Cape Peninsula is probably in the best position in regard to anti-tuberculosis measures. Deaths from tuberculosis in the City of Capetown for year ended 30th June, 1936, were :—

	Europeans.	Non-Europeans.	Total.
Pulmonary Tuberculosis	101	543	644
Tuberculosis Meningitis	12	52	64
Other forms of Tuberculosis	8	34	42
TOTAL	121	629	750
For the Cape Divisional Council Area :—			
Pulmonary Tuberculosis	7	96	103
Tuberculosis Meningitis	—	8	8
TOTAL	7	104	111

The Cape Divisional Council has no hospital, but sends cases to the City Hospital and Nelspoort.

Taking the City Council area and the Cape Divisional Council area together there are 128 deaths from tuberculosis among Europeans a year. The accommodation for cases of tuberculosis is, at City Hospital, 42 beds, now being increased to 84, and, say, 60 beds at Nelspoort, a total of 124 beds. Twenty beds for European males are available at Duin-en-dal, so that as regards Europeans the position in the Cape Peninsula will compare very favourably with conditions overseas. The position regarding non-Europeans in the Cape Peninsula area is, however, very unsatisfactory. There are 733

deaths a year from tuberculosis, while the number of available beds for treatment and isolation number only 84 at the City Hospital and about 20 at Nelspoort. Another non-European block of 36 beds is in course of erection at Nelspoort; so that in the near future approximately 120 beds will be available, which is 16·3 beds per 100 annual deaths. Many of the Coloured people are unwilling to undergo residential treatment. This may in a large measure be due to financial and home difficulties.

The Care Committee supplies assistance to non-Europeans as well as Europeans, and also the King George V Jubilee Fund helps the dependents of patients undergoing institutional treatment.

In any scheme which successfully deals with tuberculosis, there is one essential: the patient must always be under medical supervision. In Europe a system of clinics is in operation. The functions of such clinics are:—

(1) *Diagnosis.*—Patients who are found to have symptoms or signs suggestive of tuberculosis are referred by their medical attendant for fuller investigation including x-ray examination.

(2) The immediate contacts are examined and home conditions investigated.

(3) The most suitable line of treatment is recommended. Thus with suitable home environment an early case might be treated at home, although it is better in all cases to undergo a period of institutional treatment. With the increased number of beds available this is now possible as far as Europeans are concerned.

(4) Supervision of patients after their return from sanatorium or hospital. Care work must be closely associated with the clinic. There should be no question of care committees functioning except in the closest touch with the medical officer dealing with the cases.

(5) The medical officer of the clinic should be in charge of small settlements for patients discharged from the sanatorium. The settlements can serve a very useful purpose. At Duin-en-dal, patients discharged from the sanatorium live under sanatorium conditions while awaiting suitable employment. A start has been made in teaching industries, a function which must be further developed.

The medical officer of the clinic must have observation beds available, apart from those used for treatment. While such facilities are available at the larger centres such as Capetown, Port Elizabeth, and, within a short time, at Durban, greater difficulty exists in the country districts. A system of tuberculosis officers has been discussed, but is not yet in operation.

It is realised that facilities for the after-treatment of patients discharged from the sanatorium are at present very inadequate, but steps are being taken to remedy this and several local authorities outside the large centres are contemplating the establishment of clinics. Time is necessary to develop a complete anti-tuberculosis scheme, but progress in such a direction is now much more rapid.

In a thickly populated country, the development of such a scheme is much easier than in a diffuse country like the Union of South Africa. It has been urged in certain quarters that colonies for the segregation of consumptives should be established in the Union. These colonies must be a " follow-on " from the sanatorium. It is obviously useless to send advanced cases requiring hospitalisation to a colony. The colony should help to rehabilitate the patient who is fit to work but who cannot return to his former employment.

In addition to considerable progress in providing facilities for the treatment of actual cases, the Department has aimed at preventive work. The demolition of slums and the re-housing of the poorer classes are being proceeded with, and it is hoped that within a few years the prevalence of tuberculosis among all races in South Africa will be very considerably diminished. As mentioned elsewhere, a nutritional survey is to be commenced shortly. Proper diet is most important. On a recent visit to the Transkei, responsible officials and private people commented on the change in the dietary of Natives during recent years. At one time every kraal had a calabash of sour milk which was available to all. Now many Natives have replaced cattle by sheep as wool fetches good prices. The result is that to-day many Natives get little or no milk in their diet, a loss which is having serious repercussions on the health of the Native people.

The extent to which tuberculosis occurs in the Union is not accurately known. Notification is still somewhat defective, and figures compiled from this source are liable to give an erroneous impression. The cases notified during the year are set out in Table K (i) and are seen to total 10,551, an increase on last year when the number was 8,755.

TABLE K (i).—TUBERCULOSIS: NOTIFICATIONS DURING THE YEAR ENDED 30TH JUNE, 1937.

Province.	European.	Non-European.	Total.
Cape (excluding Transkei)	466	4,437	4,903
Transkei	7	2,415	2,422
Transvaal	100	1,522	1,622
Natal	127	1,242	1,369
Orange Free State	12	223	235
UNION	712	9,839	10,551

The death-rates from tuberculosis for Europeans in the Union from 1912 onwards are shown in Table K (ii).

Table K (ii).—Death Rates from Tuberculosis per 100,000 of Population—Europeans only.

Year.	Cape.			Natal.			Transvaal.			Orange Free State.			Union.		
	M.	F.	P.	M.	F.	P.	M.	F.	P.	M.	F.	P.	M.	F.	P.
1912	70·55	44·83	58·11	85·84	62·66	75·03	55·97	26·97	43·14	29·58	28·09	28·89	61·10	38·32	50·49
1913	70·19	53·93	62·31	81·15	52·19	67·60	57·61	22·43	41·88	29·54	24·13	27·02	61·21	39·67	51·13
1914	60·82	40·27	50·85	83·59	32·85	59·80	57·60	25·42	43·08	28·44	14·31	21·81	57·26	31·39	45·10
1915	56·42	40·43	48·64	69·37	33·52	52·52	60·69	21·73	42·95	19·98	25·92	22·78	54·26	31·76	43·63
1916	42·31	44·91	43·58	75·22	35·95	56·72	72·37	33·91	54·71	27·30	16·30	21·99	53·91	36·77	45·78
1917	64·12	51·27	57·53	66·75	38·21	53·28	70·23	22·42	48·09	37·75	16·12	27·44	63·18	35·55	50·02
1918	52·07	39·25	45·81	64·87	46·97	56·39	76·62	21·28	50·80	37·65	18·20	28·33	60·24	31·06	46·28
1919	41·56	49·23	45·32	57·63	30·66	44·73	82·21	13·39	49·82	43·60	12·37	28·61	57·95	30·55	44·77
1920	52·55	39·07	45·94	73·70	43·50	59·14	72·91	19·73	47·70	45·30	17·79	32·08	60·92	30·07	46·00
1921	36·99	64·06	60·48	74·93	24·00	50·21	102·08	22·70	64·22	54·13	23·12	39·20	74·65	40·87	58·26
1922	61·70	55·91	58·84	35·64	11·54	23·90	75·78	22·41	50·24	20·07	19·52	19·81	59·27	35·56	47·74
1923	55·03	52·43	53·74	41·62	40·45	41·05	74·45	21·12	48·77	19·91	17·17	18·59	56·53	35·91	46·46
1924	67·04	52·82	60·00	50·93	36·38	43·77	84·54	23·41	55·01	14·71	22·25	18·33	65·47	37·08	51·59
1925	65·65	62·14	63·91	73·89	40·51	57·42	74·27	21·84	48·87	30·01	12·59	21·65	65·19	39·68	52·70
1926	58·97	57·36	58·18	49·23	39·85	44·64	95·54	24·41	61·09	24·89	16·22	20·68	67·29	38·90	53·41
1927	61·36	59·87	60·62	71·95	28·73	50·78	78·78	17·87	49·20	24·58	12·98	18·94	64·30	36·10	50·50
1928	60·72	56·51	58·64	54·99	25·55	40·56	85·08	20·74	53·75	31·76	15·74	23·96	65·61	35·69	50·95
1929	57·98	51·63	54·85	44·58	22·56	33·78	72·48	18·08	45·95	22·16	17·47	19·87	57·70	32·54	45·37
1930	62·20	50·58	56·46	51·74	31·51	41·81	73·84	18·96	47·09	23·47	6·87	15·36	61·05	31·96	46·78
1931	55·79	55·75	55·77	54·26	26·34	40·54	64·26	15·05	40·33	24·81	11·92	18·49	55·41	32·62	44·22
1932	51·02	54·55	52·77	58·63	24·66	41·92	59·19	16·40	38·37	20·02	15·83	17·96	51·49	32·84	42·33
1933	57·48	54·40	55·95	46·86	18·64	32·96	52·21	14·58	33·88	22·86	6·90	15·01	50·60	30·44	40·68
1934	50·85	50·23	50·54	50·31	26·97	38·81	52·30	16·50	34·85	19·03	12·77	15·95	47·93	30·88	39·54
1935	50·85	56·52	53·68	43·39	28·72	36·07	49·18	16·83	33·54	14·63	26·16	20·31	45·76	34·93	40·43
1936	46·61	44·72	45·67	45·03	15·69	30·35	45·28	12·57	29·49	18·65	9·08	13·93	43·12	25·40	34·40

Prior to 1921 certified deaths only were included.
M. = Males; F. = Females; P. = Persons.

Nelspoort Sanatorium.—This institution continues to do very valuable work. It caters for three classes of patient:—

(1) *Free Patients.*—A quarter of the cost of treatment is paid by the local authority and a quarter by the Provincial Administration concerned, the remainder being paid by the Department of Public Health.

(2) *Part-paying Patients.*—In this case the patient pays a contribution towards the cost of his treatment, the balance being paid in the same proportions by the authorities above-mentioned.

In these two classes of patient, application for admission must be submitted by the local authority, which guarantees payment of the agreed amount in each case. The tariff per patient per day is fixed periodically by the Treasury on the advice of the Advisory Committee—representing the Cape local authorities, the trustees of the late Mr. Garlick, and the Government.

(3) *Full-paying Patients.*—The institution was not intended for full-paying patients, but as in the early years the other classes of patients did not take up all the beds, and as applications were received from people willing to pay the full rates, such patients were admitted at a tariff of 12s. 6d. a day.

The average daily number of patients during the year was:—

European	74·6
Non-European	33·9
Total	108·5

The average length of stay was 173 days for European and 130 days for non-European patients.

The number of patients admitted during the year was 190 Europeans and 99 non-Europeans, a total of 289. The patients admitted are classified into two groups, as follows:—

Tuberculosis minus group, i.e., cases in which *Tubercle bacilli* have never been found in the sputum. This group includes, e.g., cases of pleurisy with or without effusion.

Tuberculosis plus group, i.e., all patients in whom *Tubercle bacilli* have been found at any time. This group is divided into three stages:—

Stage I.—Patients with slight if any constitutional disturbance, and in which the obvious physical signs of the disease are very limited in extent.

Stage II.—All cases which cannot be placed in Groups I or III.

Stage III.—Cases with profund systematic disturbance or constitutional deterioration, with marked impairment of function, cavitation, and with little or no prospect of recovery.

Using this classification Table K (iii) has been constructed.

TABLE K (iii).—CONDITION OF PATIENTS ADMITTED TO NELSPOORT SANATORIUM.

	Tuberculosis Minus Group.	Tuberculosis Plus Group.		
		Stage I.	Stage II.	Stage III.
European	18	16	108	48
Non-European	13	3	45	38
TOTAL	31	19	153	86

In Table K (iv) are shown the numbers of patients that were admitted to and discharged from the institution during the year, and the numbers of deaths.

TABLE K (iv).—ADMISSIONS, DISCHARGES AND DEATHS AT NELSPOORT SANATORIUM, YEAR ENDED 30TH JUNE, 1937.

	Total.	Europeans.			Non-Europeans.		
		M.	F.	T.	M.	F.	T.
In Sanatorium on 1/7/36.....	100	34	33	67	23	10	33
Admitted during year.....	289	104	86	190	66	33	99
Died during year.....	20	5	7	12	5	3	8
Discharged during year.....	237	86	62	148	61	28	89
In Sanatorium on 30/6/37.....	132	47	50	97	23	12	35

11. *Typhus or Rickettsiosis.*—Of the various typhuslike diseases only three have been identified in Southern Africa. These are tick typhus, a mild condition locally known as tick-bite fever, another condition which has been termed South African rat-flea typhus which also only exceptionally gives rise to serious symptoms, and louse typhus. The last-named is of serious public health import and accounts annually for many hundreds of deaths among the Bantu population.

TABLE L (i).—TYPHUS FEVER IN THE UNION: CASES AND DEATHS REPORTED SINCE 1923, FOR YEARS ENDING 30TH JUNE.

Year.	Cases.	Deaths.
1923.....	7,099	755
1924.....	2,122	382
1925.....	1,144	163
1926.....	1,135	146
1927.....	895	136
1928.....	1,331	208
1929.....	1,480	193
1930.....	1,782	212
1931.....	1,541	261
1932.....	1,550	292
1933.....	2,125	302
1934.....	5,956	662
1935.....	6,826	998
1936.....	1,605	284
1937.....	1,007	168

The cases reported do not by any means give a complete picture of the effects of louse typhus infection in the country, as in remote Native areas numerous outbreaks must necessarily go unrecorded. Nevertheless the numbers which come to official notice are formidable enough as will be seen from Table L (i) in which the recorded cases and deaths for the past fifteen years are shown. The close association of typhus incidence among the Bantu with economic conditions is well recognised. This is illustrated by the high figures during the depression years and the striking fall since we emerged from that depression. The drop in the figures during the past two years is to be accounted for to some extent also by a diminution of the number of susceptibles resulting from the higher incidence during the depression years.

TABLE L (ii).—REPORTED CASES OF TYPHUS IN THE PROVINCES OF THE UNION FOR YEARS ENDING 30TH JUNE.

Year.	Cape.	Natal.	O.F.S.	Transvaal.	Total.
1923.....	6,118	356	425	200	7,099
1924.....	1,392	241	286	203	2,122
1925.....	579	218	220	127	1,144
1926.....	701	87	272	75	1,135
1927.....	638	72	168	17	895
1928.....	1,154	91	68	18	1,331
1929.....	1,320	65	84	11	1,480
1930.....	1,564	57	149	12	1,785
1931.....	869	62	53	557	1,541
1932.....	1,263	51	40	196	1,550
1933.....	1,649	208	243	25	2,125
1934.....	1,905	207	3,636	208	5,956
1935.....	2,898	224	3,275	429	6,826
1936.....	835	33	280	457	1,605
1937.....	694	89	178	46	1,007

It will be observed from Table L (ii) that the bulk of the infection continues to be in the Cape Province. This is associated directly with the fact that in the eastern portion of that province there is a large population of poverty-stricken Natives.

TABLE L (iii).—TYPHUS NOTIFICATIONS AMONG EUROPEANS IN THE UNION FOR YEARS ENDING 30TH JUNE.

Year.	Cape.	Natal.	O.F.S.	Transvaal.	Total.	
					Cases.	Deaths.
1923	39	3	8	6	56	6
1924	26	8	10	2	46	3
1925	13	19	2	3	37	0
1926	22	25	6	2	55	1
1927	13	21	4	1	39	2
1928	18	30	3	1	52	0
1929	27	17	1	0	45	0
1930	34	33	2	5	74	5
1931	26	21	3	3	53	2
1932	25	7	1	0	33	2
1933	43	9	1	1	54	3
1934	23	10	12	0	45	3
1935	38	16	29	14	97	5
1936	20	13	3	4	40	2
1937	27	5	2	2	36	6

Overflow of infection from insanitary Native areas to European settlements must of necessity occur. As will be seen from Table L (iii), last year 36 Europeans were notified as suffering from typhus; six of them died.

The distribution of the 1,007 cases that occurred during the year under review is shown in Table L (iv).

TABLE L (iv).—TYPHUS FEVER: CASES AND DEATHS REPORTED DURING THE YEAR ENDED 30TH JUNE, 1937.

Province.	Number of Districts in which Outbreaks Occurred.	European.		Non-European.		Total.	
		Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Cape	43	27	5	667	87	694	92
Natal	11	5	—	84	31	89	31
Orange Free State	16	2	—	176	35	178	35
Transvaal	9	2	1	44	9	46	10
UNION	79	36	6	971	162	1,007	168

It is impracticable as yet to attempt deverminization throughout the Native areas. Until the economic level of these people is considerably raised it will not become possible for them to afford the means of reasonable cleanliness which is necessary to preclude lousiness. Meanwhile the policy of dealing with outbreaks as they occur by delousing patients and contacts is being continued.

12. *Venereal Diseases.*—There are several advances to record in the campaign against venereal diseases. Firstly by reference to Table M it will be observed that the attendances at clinics and institutions have materially increased from 39,354 Europeans and 82,572 non-Europeans for 1935-36 to 52,240 Europeans and 104,762 non-Europeans for 1936-37. This increase is to be judged as a most satisfactory sign. Treatment for venereal diseases is best offered through clinics and the above evidence confirms the view of the increasing appreciation by the public of this service. It is again necessary to indicate that Table M is not an index of the amount of these diseases in the country, from which it follows that the increases shown for this year, compared with previous years are not symptomatic of any increase in prevalence. As there can be no doubt that many sufferers do not yet seek scientific advice and treatment, increases in attendances are not only to be expected but welcomed as an expression of the extension and improvement of the venereal disease organisation.

The actual numerical increase recorded in attendances is but one aspect of the increasing efficiency of the clinic system. Another is given in the accounts submitted by medical officers and district surgeons from several representative areas that the erstwhile antipathy of the Native is disappearing. Where previously there existed a deep-rooted suspicion and distrust of European medical methods, there is now appearing a desire for scientific treatment. This increasing voluntary appeal has its complement in a larger proportion of cases willingly submitting to the complete course of treatment. Such gratifying changes in the sentiment and attitude of the non-European population are of fundamental importance in the eventual success of the various local programmes being pursued.

Table M.—Venereal Diseases: Cases Treated and Attendances, Year ended 30th June, 1937.

Locality.	In Hospital.						Outdoor.					
	Syphilis.		Gonorrhoea and Other Venereal Diseases.		Total.		Syphilis.		Gonorrhoea and Other Venereal Diseases.		Total.	
	European.	Non-European.	European.	Non-European.	European.	Non-European.	European.	Non-European.	European.	Non-European.	European.	Non-European.
(1) *By District Surgeons.*												
Cape	13	1,207	26	284	39	1,491	457	14,345	301	1,360	758	15,705
Natal	1	289	13	36	14	325	76	7,711	60	616	136	8,327
Transvaal	16	7,933	14	167	30	8,100	444	30,105	330	2,641	774	32,746
Orange Free State	1	9	1	2	2	11	322	7,560	250	1,154	572	8,714
Total	31	9,438	54	489	85	9,927	1,299	59,721	941	5,771	2,240*	65,492*
(2) *At Institutions and Clinics.*												
Aliwal North	—	—	—	—	—	—	14	312	—	—	14	312
Barberton	—	318	—	—	—	318	—	—	—	—	—	—
Bethlehem	—	56	—	17	—	73	—	—	—	—	—	—
Bloemfontein	8	206	31	35	39	241	598	3,109	583	20	1,181	3,129
Bochem	—	681	—	8	—	689	—	72	—	3	—	75
Boksburg	—	2	1	2	1	4	193	725	406	266	599	991
Capetown	58	245	83	63	141	308	8,130	16,919	7,502	4,593	15,632	23,512
Durban	47	1,170	83	164	130	1,334	1,849	5,225	7,155	5,515	9,004	10,740
East London	—	—	—	—	—	—	334	2,274	326	741	660	3,015
Elim	—	529	—	20	—	549	2	266	—	—	2	266
Gordonsbay	—	—	—	—	—	—	—	129	—	—	—	129
Johannesburg	—	—	—	—	—	—	7,768	—	5,095	—	12,863	—
Kimberley	22	170	—	—	22	170	75	2,185	67	137	142	2,322
Kingwilliamstown	1	144	6	5	7	149	—	47	19	31	19	78
Kroonstad	—	—	—	—	—	—	—	—	—	—	—	—
Krugersdorp	—	93	—	—	—	93	28	91	12	—	40	91
Kuruman	—	18	—	—	—	18	—	161	—	—	—	161
Marianhill	—	—	—	—	—	—	—	280	6	2	6	282
Olifantshoek	—	—	—	—	—	—	4	571	—	—	4	571
Oudtshoorn	—	—	—	—	—	—	12	250	—	—	12	250
Paarl	—	—	—	—	—	—	—	862	—	—	—	862
Pietermaritzburg	1	384	—	103	1	487	293	7,359	93	6,188	386	13,547
Pietersburg	—	—	—	—	—	—	—	1,175	—	—	—	1,175
Port Elizabeth	—	—	—	—	—	—	1,212	8,016	1,774	1,470	2,986	9,486
Potchefstroom	—	—	—	—	—	—	39	2,934	—	—	39	2,934
Pretoria	—	—	—	—	—	—	1,756	9,348	5,947	4,488	7,703	13,836
Rietfontein	111	3,991	218	1,172	329	5,163	571	4,281	—	—	571	4,281
Sekukuniland (Jane Furse Memorial)	—	109	—	6	—	115	—	1,313	1	68	1	1,381
Senekal	—	—	—	—	—	—	—	1,957	—	—	—	1,957
Springs	—	—	—	—	—	—	39	4,780	34	236	73	5,016
Somerset West	—	—	—	—	—	—	8	91	—	—	8	91
Stellenbosch(Mpty)	1	45	—	—	1	45	—	485	—	—	—	485
Stellenbosch (D.C...)	—	—	—	—	—	—	—	1,459	—	—	—	1,459
Swellendam	—	9	—	—	—	9	—	—	—	—	—	—
Uitenhage	3	35	—	1	3	36	249	1,882	46	56	295	1,938
Vryburg	—	137	—	1	—	138	—	390	—	—	—	390
Total	252	8,342	422	1,597	674	9,939	23,174	78,948	29,066	25,814	52,240†	104,762†

* Patients only. † Attendances only.

One such scheme which has been inspected this year and most favourably reported upon is that operating in the Pietersburg district. The full-time district surgeon attends eight venereal disease clinics in this district, four of which are controlled by missions and four by the Native Local Council constituted under the Native Affairs Act of 1923.

Each clinic is visited fortnightly by the district surgeon, who then carries out routine injection of syphilitic cases. Attendance at the missionary clinics is arranged by the various societies, but in the case of the four Council clinics the nurses are employed by the Council on a refund basis under Act No. 57 of 1935. These Council clinics are of some significance as demonstrations of a method suitable for rural Native areas in securing simple economic medical and health services. Built and staffed by nurses out of Council funds the system is an indication of Native concern in and responsibility for local health and medical conditions. Through subsidies received from the Provincial Administration general medical treatment is combined with venereal disease care. However, whether such a Native Council system can be extended and duplicated is dependent upon matters of policy largely outside the province of this Department. The tremendous social and administrative changes following the application of the Native Land and Trust Acts of 1936 influence the situation. Cognizance of this has led to a proposal of a joint departmental conference with the Native Affairs Department to examine the medical and health problems arising out of the policy of segregation. Any programme of venereal disease treatment and control must perforce await the settlement of the major problems of the responsibility for, and method of, administration of medical and health services in the Native proclaimed areas.

Apart from such legal and administrative aspects, experience both in this country and in other countries of similar development more than justifies the argument that in primitive populations and sparsely populated rural areas, venereal disease treatment is provided most conveniently, efficiently, and economically in a combined and general medical and health scheme. The so-called polyclinic or subdispensary, where the Native can get any form of medical advice or treatment, and which serves as a centre for teaching and propagating health and sanitary knowledge seems to be the logical unit to establish in Native areas. Though so successful elsewhere, considerable difficulties obstruct such a development in South Africa. Chiefly responsible is the division of health responsibilities—hospitals and medical care of paupers being controlled by provincial authorities and infectious and venereal diseases by this Department. There are thus created administrative and executive difficulties in attempting a co-ordination in a uniform scheme of all forms of medical and health services. Until such time as these legislative problems are overcome the provision of venereal disease treatment and control is likely to be incomplete. It cannot be too strongly emphasised that venereal disease presents so many diverse manifestations that its control calls for action in all fields of medicine, health and sociology. Co-ordination of effort is essential to success.

A further note of progress is shown in several urban areas: Capetown, Durban, Pretoria and Johannesburg all record increased attendances, again to be considered as indicative not of an actual increase in prevalence, but of a growing appreciation of the services offered. As mentioned in the last annual report the appointment of full-time medical officers of health is considered of importance in securing more efficient venereal disease schemes. This has been borne out particularly on the Witwatersrand, which being the centre of the densest urban agregation is also a focus of venereal disease. The several recently appointed Reef officers all have under way most important clinic schemes for both Europeans and non-Europeans, and the great drive being conducted against insanitary Reef locations is also of direct importance in a venereal disease programme.

Additional improvements in the Reef situation are likely to follow if the present negotiations taking place between the municipalities, the Native Affairs Department and this Department concerning pass office medical examinations are successful. An assistant health officer of this Department recently inspected and reported on the procedure in Reef pass offices, and certain extracts from his report deserve mention:—

"The legislation requiring the examination of male Natives entering labour areas is class discriminatory and thus gives rise to many debatable features. In so far as social conditions affect public health policy it is open to serious doubt whether the best interests of health are being served when but one limited class of the community is subjected to compulsory medical examination. The slight antagonism or resistance that has been experienced in the past is no indication that this legal requirement will always be acceptable. There is definitely a growing number of educated and civilised non-Europeans who feel this class and race discrimination and who are already on occasions giving voice to their resentment. These dislike not alone the discriminatory legislation but also the usual herd methods of examination, when all and sundry are stripped and examined in the mass.

There must follow from such procedure, especially in its association with police, pass issues, and other official relationships, a suspicion that medical and health measures are not for the benefit of the Natives, but for repressive and disciplinary purposes. This is most unfortunate. Successful health programmes must have the co-operation and trust of the people, and, therefore, it must be considered that the medical requirements of the regulations are contrary to usually accepted health principles in so far as they tend to destroy co-operation and sympathy.

" Similar doubts as to the usefulness of the legislation arise in considering possible medical advantages. As a quarantine measure, medical examination of male Natives alone entering any given district, must be considered useless. No single disease of an infectious nature is peculiar to the adult male; therefore, apart from the conveyance of infection by carriers, subclinical and masked cases, females and male children still exist to transport any given disease into a community. Further, though no absolute protection from disease entrance is given, it is also questionable whether any relative prevention follows. For example, without elimination of syphilitic infectious females on entrance to, or control of syphilis within a community, the detection of males on entrance with communicable forms of the disease is not likely to affect the general incidence of syphilis within the given community. As a means of controlling the invasion of a community by a communicable disease, the measure has little or no value.

" Nevertheless an examination of this kind is not entirely useless. If conducted with reasonable efficiency and completeness it can accomplish much in raising the proportions of those vaccinated against smallpox, and can and does facilitate the provision of medical treatment for numbers of sufferers both from infectious and other diseases.

" In another direction it has great potentialities for good if viewed in a sympathetic and broad manner. This is a channel for health education and propaganda. The pass office medical examination may be the only contact the Native has with civilised health organisation, and much could be done through this contact to awaken his intelligent interest and co-operation in hygiene.

" Summing up, a medical examination of male Natives entering labour areas has an extremely limited importance in the control or prevention of infectious disease, but it has some value in facilitating medical care and treatment and may have great value, if wisely conducted, for propaganda purposes. On social grounds the race and class discrimination involved is an undoubted danger to securing the co-operation of the Native peoples in any public health programme; therefore, it is extremely doubtful whether a compulsory medical examination of a single group is at all justified.

" Assuming that the compulsory measure implied in the regulations is to be continued, and that its application is to be enforced, the only satisfactory solution is to transfer this function to the municipal health departments of each area.

" If the medical examination is to be viewed truly as a public health measure, then the necessity of relating it to the local health machinery becomes obvious. The local medical officer of health or his representative has the preventive outlook, as opposed to the clinical or medico-legal view-point of the district surgeon, and it is felt that this generalisation is of considerable significance. The health official will use the examination to further the health interests of his area, and will instinctively take advantage of it for propaganda and health educative purposes in the Native community. Yet again, in his relationship to the local preventive machinery—sanitation, isolation accommodation, infectious disease and other clinics, means for protecting food and water supplies—the medical officer of health has an important strategic position not held by the district surgeon for enhancing the health situation of the area. It is to his definite advantage and interest to approach the Native sympathetically, as he is so intimately concerned in securing the co-operation of the Native section of his community.

" Then again, the nature of his duties enables him to establish a fixed time-table allowing attendance at the place of medical examination at regular times. Such an arrangement would largely remove the existing causes of complaint made by the public and would also allow of more considerate treatment being given to the Natives themselves. On the part of the pass office officials much confusion and delay would be obviated, as they would be in a position to organise registrations more satisfactorily, especially in evolving methods to secure the medical examination of every ' boy '. Such arrangements have already been most successfully established by the Boksburg Medical Officer of Health."

Certain arrangements which have been launched in the last year are of considerable importance in the fight against venereal diseases, but will not show their maximum effect for some time. Firstly, there is the more vigorous propaganda campaign being initiated. The Social Hygiene Committee of the

Red Cross Society, Transvaal Branch, is especially active, and following proposals and assistance given by this Department, has arranged for a medical officer to undertake lecturing and educational tours, especially in Native communities. This officer has recently received training in modern social hygiene methods of propaganda in Great Britain.

Another development of propagauda which will have important repercussions in venereal disease fields is the new policy of health education recently established by the Department and discussed more fully in another section of this report.

Though limitations of staff and existing legislative and administrative arrangements have hampered to a certain extent the evolution of its venereal diseases policy, in general the progress in fundamental work made by the Department in the last year may be considered fairly satisfactory.

13. *Yellow Fever.*—Health authorities in Africa have for some years regarded with increasing anxiety the possibility of the spread of yellow fever from its long established focus on the west coast to other parts of the continent.

It is recognised that as Africa becomes opened up by road and air traffic this danger will materially increase particularly on the east coast where yellow fever, once introduced, would most certainly spread.

At the Pan African Conference of the Health Committee of the League of Nations held at Capetown in November, 1932, it was resolved as a first step to investigate the distribution of yellow fever throughout the continent by sampling sections of the Native population at selected points, and submitting specimens of their blood to the mouse protection test, a procedure which would indicate past iufection in the individual. These tests were undertaken by the Rockefeller Foundation in New York, whose services in connection with yellow fever throughout the world have been invaluable.

The mouse tests, meagre in number compared with the population and areas involved, disclosed past infection north of latitude 15°S and west of lougitude 35° E, a distribution far beyond the boundaries ordinarily assigned to yellow fever which had at one point crossed the line of the air route from the Sudan to the south.

At the Pan African Congress held at Johannesburg in November, 1935, yellow fever was again given pride of place. Dr. Soper of the Rockefeller Foundation, who is in charge of yellow fever control in South America, gave details as to jungle yellow fever and showed that not only can the disease be conveyed by mosquitoes other than the ordinary vector *Aëdes aegypti,* but that certain species of monkeys act as hosts in addition to man, and were keeping the disease going in otherwise " silent " areas. There is a very definite suspicion that the same condition occurs in Africa

All parts of this continent are not equally vulnerable to yellow fever. The east coast as far south as Durbau certainly is. Conditions along the backbone of the continent are less favourable to the spread of the disease, in view of altitude, climate and vegetation. This backbone runs centrally from the Great Lakes southwards. It constitutes no barrier, however, and is being rapidly bridged by an increasing volume of air and road traffic almost incredible to those not conversant with local conditions.

The inauguration of the air service down the coast made it desirable that immedate steps be taken to prevent any possibility of conveyance by that agency, although it must be emphasised that while an air service constitutes perhaps the most facile means of spread it is the easiest to control and other forms of traffic will ultimately have to be dealt with. The speed of an air service and the facility with which planes carry insects, particularly mosquitoes, are factors of the utmost importance.

Yellow fever is an acute infectious disease caused by a filterable virus normally carried from sick to healthy persons by mosquitoes, usually in nature by *Aëdes aegypti.* The disease exhibits marked variation in the virulence of its attack, and numerous mild cases particularly in Native children pass undiagnosed.

From the point of view of the sanitarian the most important points about yellow fever are:—

(*a*) The incubation period, i.e. the time which elapses between the patient being bitten by an infected mosquito and his showing signs of the disease, is 3 to 6 days.

(*b*) A single attack no matter how mild, confers immunity. This immunity may be discovered by the mouse protection test referred to.

(*c*) The patient infects mosquitoes during the first three days of his illness, and possibly during the incubation period.

To safeguard the Union, therefore, it is necessary to make sure that

(*a*) no person in the incubation stage or in the first three days of the disease who might travel in a plane comes into contact with mosquitoes, particularly *Aëdes aegypti*, at any place along the air route; and

(*b*) that no mosquitoes which might possibly be infected are carried by the plane or released therefrom.

To make precautions effective it is necessary for the Department to—

(*a*) be in possession of information as to where yellow fever actually exists, or rather as to the places which can be safely presumed to be yellow fever free;

(*b*) have information as to the movements of passengers arriving at Union airports for the six days prior to their arrival;

(*c*) be in a position to isolate immediately any sick passenger or one who may possibly be in the incubation stage, so that there is no possibility of his infecting local mosquitoes either at the place of isolation or in transit thereto;

(*d*) prevent any mosquitoes leaving any plane which has been exposed to any possibility of getting infected mosquitoes aboard;

(*e*) be in a position to disinfest every part of a plane expeditiously and thoroughly immediately on its arrival—at any time, day or night;

(*f*) ensure that these measures are carried out with a minimum of inconvenience to the travelling public and to the mail service.

A serious difficulty at the port of Durban Bay is that one cannot depend upon an entire absence of susceptible mosquitoes at any time of the year. There are heavy bush infested areas in and around the town and there are wild monkeys. There are other places on the air route where facilities for the spread of yellow fever may be as great. As an instance, however, of the vulnerability of the coastal area in Natal, the outbreaks of dengue fever which have visited Durban from time to time may be quoted. These are carried by the mosquito responsible for most of the urban yellow fever in other parts of the world.

Were yellow fever introduced to Durban, the disease would be quickly got rid of in town. An efficient Corporation Health Department plus a panic-stricken population would probably deal with mosquitoes so effectively that the disease would hardly cross a street.

Once it had penetrated into the country, however, the difficulties in checking it would be almost insuperable. The economic consequences of even the smallest outbreak would be far reaching. All health bills would have to be endorsed. Our sea trade, particularly with the East, would be seriously affected, no matter what precautions were taken to make things absolutely safe for shipping. The Department cannot gamble. The defence of South Africa must be absolutely one-hundred per cent. safe and cannot be left to the efforts of neighbouring countries.

The whole position was discussed at a meeting of health officers in Nairobi in March, 1937, held under the chairmanship of Mr. L. B. Freestone, O.B.E., Secretary, East African Governors' Conference. It was attended by representatives of the Rockefeller Foundation now establishing their laboratory for the study of yellow fever at Entebbe, by the medical adviser to Imperial Airways who came out from London, by officers of the Royal Air Force, the Government Entomologist, Kenya, and by a deputy chief health officer of the Union, Dr. Park Ross, who has charge of the arrangements at Durban. By courtesy of the Kenya Government the Union representative was enabled to inspect the dispositions for preventing the spread of the disease at Kisumu and Mombasa after the conference.

Discussion bore out the unpleasant fact that our knowledge of the exact distribution of yellow fever in Africa is most incomplete and that there is an immediate need for precautions in respect of traffic proceeding eastwards from West African countries including the Congo Free State.

The establishment of anti-amaryl and sanitary aerodromes through which traffic might be shepherded was strongly favoured, but it appeared to be concluded by some that the institution of mosquito-free aerodromes should constitute the main if not the only defence against insects.

The Government Entomologist for Kenya submitted an impressive list of insects collected at Kisumu, having apparently come aboard planes at stopping places on the Nile. Our own observations at Durban since the sea-plane service started has shown that insects are readily carried by planes and will continue to be carried until effective disinsectisation at the several ports *en route* is introduced.

The value of anti-larval work at seadromes is unquestionable, but too much reliance is apt to be placed on such work. Notable examples could be quoted from tropical Africa where costly measures against larvae have had to be supplemented by mosquito-guarding and insecticidal spraying of dwellings.

As a sole means of defence at aerodromes in mosquito-infested terrain, anti-larval work does not suffice. It has to be supplemented by disinfestation of planes. Further, at certain aerodromes effective anti-larval work is not a practical proposition. At the first site chosen by the Imperial Airways Authorities at Durban this was the case. There are other aerodromes where, on account of the cost or other reasons it cannot be done. Further, planes may have to land in emergencies at places other than aerodromes.

Just as it is possible to arrange matters so that one can travel in the most fever ridden parts of Africa with a minimum of risk, so, as will be shown, it is possible to equip aeroplanes in such a way as to render the risk of their conveying insects from one port to another and releasing them there practically nil.

This Department has submitted proposals to make every aeroplane self-contained in the matter of defence against insects. Effective standardisation of measures in this respect is not only desirable but essential.

It was intimated at the Nairobi meeting that the question of dealing with insects on planes would be the subject of a research in London in the future and a programme showing the subjects to be covered by such research was disclosed. But with only two months to go before the seaplane service became an established fact, it was obvious that the Department had to arrive at an immediate procedure. In this connection the Union representative detailed the arrangements being made for the examination and, if necessary, the detention of passengers at Durban, and stressed the advantages of arriving at a system of disinfestation of planes which would eliminate the personal factor as much as possible and make it automatic.

It was obvious from the first that the main difficulty would be the mechanical problem of getting a disinfectant quickly into a plane and, if necessary, out again, rather than a mere choice of agent, and that this mechanical problem was bound up with the design of the plane to be treated. There was some difference of opinion as to whether the agent used should be a gas, or a liquid which required atomisation. In the former class by far the most effective agent would be cyanide or preferably a similar but less lethal agent.

Experiments with cyanide at Kisumu and Durban were detailed, but it was felt that unless a satisfactory scheme of getting a gas into and out of a plane was evolved, preferably by a system of tracheal ducts as put forward by the Union Representative, gas disinfestation as a routine measure at the several ports could not be considered as a practical proposition. That there are advantages in using cyanide on occasions is admitted but for general use it is much too dangerous and the use of other less lethal gases was considered.

The question of installing duct systems was referred to Imperial Airways to explore as it was felt that the matter had not proceeded far enough to warrant any expression of opinion by the Nairobi conference which passed a resolution to the effect that it " notes with appreciation that investigations with regard to disinfestation of aeroplanes are being carried out in London and in Durban to which it attaches the greatest importance ".

The existing practice on land planes was to hand-spray with liquid insecticide. This process is unsatisfactory. An expeditious service requires that passengers and baggage be evacuated from planes at the earliest possible moment, preferably without any delay whatever. Yet to effect that before disinfestation is undertaken gives every chance for mosquitoes to escape before one sets about compassing their death, a definitely unsound procedure, but one which, nevertheless, appeared to be accepted in many quarters as inevitable. Trap landing cages as applied to land planes are unsatisfactory, specially as regards baggage exits. They are impracticable on sea-planes.

It became evident that there was room for a great deal of improvement on existing methods of safeguarding planes. The Department's officers at Durban enlisted the co-operation of the South African Fumigation Company, Limited. The problem was investigated anew with them. Experiments to incorporate gases and toxic liquids with liquid carbon dioxide were first engaged in and proved for the most part failures. On the arrival of the first seaplane, however, it was noted that the bulkheading of the ship allowed of baggage, mail and bedding lockers being disinfested separately from the rest of the ship without any inconvenience to passengers or the working of the plane. Further, these could be done during flight but preferably after the plane had landed on the water in which case baggage doors could be opened at once on arrival at moorings and locker contents be evacuated, all locker-carried mosquitoes being already dead.

In connection with the evacuation and subsequent disinfestation of passenger quarters, it was thought that were one exit provided with a light detachable crossed curtain placed in position at ports, there would be no reason why passengers should not disembark from a plane as soon as it arrived, leaving a search of their quarters and subsequent disinfestation, if considered necessary, to be done later.

The choice of liquid disinfestants does not present difficulty. At Durban the Department uses pyagra, at Kusumu, Stafford Allen's Compound is favoured. Both are effective if applied in proper doses. Their inflammability in the dilution required is nil, an important point in planes. As to smell, Stafford Allen's is less pungent than the other. Provided proper dosage and atomisation is used, either should meet all requirements.

Experiments at Durban were then directed to secure an effective distribution, preferably automatic, of either of these in doses appropriate to the several compartments.

It was felt that this would be best achieved by plane-carried apparatus to obviate the necessity of taking pressure pumps aboard at each port. This would allow for disinfestation during flight if such were desired. Further, insects in numbers come aboard on occasions while a plane is at rest or refuelling, and it is an advantage to clear them out of cabins either before the plane takes off or immediately afterwards when the punka-louvre ventilation, which only functions in the air, rapidly removes any smell. For these and many other reasons plane-carried apparatus is desirable, even if the authorities at different ports wish to choose their own liquid disinfestant.

Trials were made at Durban of light electrically driven hand sprays with adjustable jets which could be adapted to the plane's own electric plant, and used by one man with one hand. The departmental choice in this respect was the pyagra electric sprayer made by Jeyes, Ltd., of London. But while the handiness of this spray is unquestionable it is not automatic. Disinfestation would still take some time and its efficacy in practice would still depend on the human factor, bearing in mind that in luggage compartments the places favoured by resting mosquitoes are often those most difficult of access.

We are indebted to Mr. Larmuth of the South African Fumigation Company, Limited, however, for the genesis of a scheme which seems to have solved the whole problem of automatic introduction of disinfestant into closed compartments in measured doses, and for working it out and putting aboard the " Challenger " a working plant to show its possibilities.

A measured dose of disinfestant is introduced into a steel cylinder about $4\frac{1}{2}$ inches long and $1\frac{1}{4}$ inches in diameter. To this is connected a fine $\frac{1}{8}$ inch or smaller pipe line fitted with two or more jets for atomisation, plus an attachment for sparklet bulbs. The total weight of the apparatus is under $1\frac{1}{2}$ lb., and an outfit as specified above distributes the requisite amount of Stafford Allen's compound or pyagra throughout the large after-baggage rooms of a seaplane in five seconds. After an interval of ten minutes hatches may be opened.

The cylinder is screwed to the bulkhead inside the baggage compartment. It and its piping are fixtures. The sparklet bulb may be arranged to work from the outside to avoid any opening of doors of mail and baggage lockers until the time comes to open up outside hatches in port for discharge of cargo.

A more elaborate form, still weighing under five pounds, provides for a master cylinder situated at a central point in the plane as for instance the steward's pantry. To this cylinder measured charges appropriate to the several compartments are introduced and conveyed by fine pipe lines to points selected for discharge. With this apparatus a ship may be disinfested piecemeal in a few minutes either in the air or on the water without any disturbance of passengers or cargo. A further advantage is that if desired, liquid hydrocyanic acid can be used in the same apparatus and its dosage automatically adjusted to the high concentrations necessary for dealing with agricultural pests, which planes may carry.

This is a new principle in disinfestation. Its applications are unending and its author is to be congratulated on it. Full details have been supplied to Imperial Airways and to the research authorities in London with a recommendation to consider making the system either as it stands or in a modified form a standard fitting in planes proceeding to the Union.

The conditions necessary for the safe conduct of flying boats have been enumerated. On arrival on the water at Durban they proceed to moorings and keep all doors (except mooring hatch) closed to prevent exit of mosquitoes. To avoid possible escape of mosquitoes, cabin fumigation is begun by the fumigation officer at the exit door, after which the passengers leave for the quarantine float. Baggage and mails are fumigated *in situ* in the plane as a

matter of routine. Disinfestation of cabins is taken in hand if a search for mosquitoes shows a necessity for it. Flying insects have been found in most planes arriving at Durban Bay.

When crossed curtains plus automatic disinfestation is provided, passengers, baggage and mail may leave the plane at once. The elimination of fumigation delays is, therefore, in the hands of the Airways Company itself. On arrival at the quarantine float, which is moored near the planes and in a position safe from shore mosquitoes, passengers pass the health and immigration authorities, after which they leave together with baggage for the shore and customs examination.

This procedure was instituted from the inception of the seaplane service. It is working satisfactorily, the average delay, due to health and immigration formalities being twenty minutes, during which time tea is served by Imperial Airways on the quarantine float, where amenities compare favourably with those to which passengers on the trans-continental route are accustomed.

The float was, however, designed to serve a second purpose. It has offices for port health and immigration authorities, ladies' room and kitchen, and on the promenade deck above two cabins and a bathroom. It is mosquito-free.

It will be remembered that the Department has to be in a position to isolate effectively and immediately any passenger without a possibility of his coming into contact with local mosquitoes, either at the place of isolation or in transit thereto. No hospital or place of isolation in or about Durban can satisfy these conditions. Even if a suitable shore station were selected it would still be necessary to erect and maintain accommodation which might never be used. The float, although functioning as an examining office, is designed as a small isolation hospital unit, and will be used for that purpose should it be necessary to detain passengers. It is only necessary to send hospital requisites aboard as required, and to get complete isolation from man, mosquitoes and traffic by towing the float to a selected berth in the Bay away from the air base and shipping.

The mobility of the accommodation has already proved advantageous. Imperial Airways have not finally decided where their final location on the Bay is to be. Their first choice of the Bluff had to be rejected, their present location at Salisbury Island is temporary, but, wherever they do go, the float can follow; the isolation hospital is in being and is mosquito-proof.

The arrangements have, from the first, been satisfactory to the Health and Immigration Departments, and they meet with the unqualified approval of the municipal authorities.

Suitable arrangements of a similar character for the disinfestation of aeroplanes will have to be devised and brought into operation in connection with the projected service between the Union and Kisumu via the West Coast.

14.—*Acute Poliomyelitis.*—Infantile paralysis or acute anterior poliomyelitis has not during recent years approached epidemic conditions in South Africa. The numbers of cases notified by medical practitioners during the past three years were:—

1935	61 cases.
1936	26 ,,
1937	82 ,,

Nevertheless, an alert policy is adopted with regard to the disease, both because it has in the past been known to reach serious proportions and also because of the tragically crippling sequelae.

Because of the latter fact the Department is making enquiries as to methods for dealing with the results of this and similar diseases of the central nervous system. Very good results are reported from the Elizabeth Kenny Clinic in Brisbane. This clinic was established by the Queensland Government for the purpose of treating the types of crippling resulting from anterior poliomyelitis, cerebral diplegia of childhood, birth palsy and paralysis resulting from meningitis. These methods were enquired into by the Southern Transvaal Branch of the Medical Association of South Africa. A sub-committee of this Association reported on the practicability of establishing an Elizabeth Kenny Clinic in South Africa, and were unanimous in recommending that the treatment merited fuller investigation and trial.

Information has been received that a series of cases of paralysis are being treated by Miss Kenny in the Queen Mary's Orthopaedic Hospital, Carshalton, under the supervision of an expert committee of medical men. The Department has arranged to be kept posted with the results of this investigation.

VI.—GENERAL.

1. *Housing and Slum Elimination.*—Full details of the working of the Housing Act, No. 35 of 1920, from the date of its commencement, are given in the report of the Central Housing Board for the calendar year 1936 (U.G. No. 23, 1937), which was laid on the tables of parliament. A summary of the position as at 30th June, 1937, is given in the following table:—

TABLE N.—HOUSING ACT NO. 35 OF 1920.—WORKING FROM PROMULGATION (16TH AUGUST, 1920) TO 30TH JUNE, 1937.

Province.	Loan Applications Approved.			Loan Issues.	Number of Houses.					
	European.	Non-European.	Total.		Completed.	Under Construction.	Approved, but not yet commenced.	Total.	Total for European Occupation.	Total for non-European Occupation.
(A) *Economic Housing.*	£	£	£	£						
Cape	1,407,450	666,389	2,073,839	1,992,373	7,147	30	180	7,357	2,288 (*a*)	5,069 (*b*)
Natal	556,810	87,523	644,333	624,215	1,001	12	19	1,032	562	470 (*c*)
Orange Free State	535,084	20,618	555,702	551,477	1,585	378	351	2,314	674 (*d*)	1,640 (*e*)
Transvaal	1,369,716	254,712	1,624,428	1,529,257	3,833	147	308	4,288	1,838	2,450 (*f*)
TOTAL	3,869,060	1,029,242	4,898,302	4,697,322 (*g*)	13,566	567	858	14,991	5,362	9,629
B) *Sub-Economic Housing.*										
Cape	393,815	431,117	824,932	372,412	1,484	4	1,179	2,667	1,303	1,364
Transvaal	512,126	611,000	1,123,126	315,296	136	194	4,489	4,819	719	4,100
Natal	—	3,200	3,200	1,392	—	—	36	36	—	36
TOTAL	905,941	1,045,317	1,951,258	689,100	1,620	198	5,704	7,522	2,022	5,500
TOTAL (A) AND (B)	4,775,001	2,074,559	6,849,560	5,386,422	15,186	765	6,562	22,513	7,384	15,129

(*a*) Includes a hostel to accommodate 86 persons.
(*b*) Includes 1,337 single rooms in blocks, 8 barracks and 160 flats.
(*c*) Includes 3 barracks and 36 single rooms in blocks.
(*d*) Includes a hostel for European girl employees at Bloemfontein.
(*e*) Includes 24 single rooms in blocks, the balance of 845 representing the approximate number of dwellings to be built out of a tota lloan of £16,818 made to three Local Authorities for use exclusively in purchasing materials to be advanced to Coloured persons and Natives building their own homes.
(*f*) Includes 303 single rooms in blocks, 3 compounds and 13 hostels.
(*g*) Includes £1,467,427 re-issued out of repaid capital.

The continued period of prosperity combined with the publicity given to housing matters in the press has had the effect of drawing attention to the facilities made available by the Government by way of cheap loans for housing purposes and the taking of further interest on the part of local authorities in such matters. The year under review was notable for the number of inquiries received from the smaller local authorities regarding the conditions under which housing loans were granted. It was further notable for the number of big schemes contemplated by the larger local authorities mainly in connection with activities under the Slums Act in the cleaning up of insanitary areas which necessitated additional accommodation being provided for the persons who were displaced consequent upon existing premises being declared slums—amongst the larger schemes being that of Port Elizabeth in connection with the cleaning up of the Korsten area for which a sum of £1,392,000 out of subeconomic funds has been allotted to the Council to enable it to acquire the area in question and to finance the construction of dwellings for the rehousing of the persons who will be compelled to cease occupation of slum dwellings in the area.

Economic Housing.—The Government's commitment in respect of economic housing stands at £4,081,000. Of this amount the sum of £3,229,895 has been issued whilst a further sum of £1,467,427 out of capital repayments has been reissued by the Provincial Administrations bringing the total issues from economic funds up to £4,697,322. A sum of £175,000 has been made available by the Government for issue during the present financial year 1937-38 in addition to which it is estimated that the Provincial Administrations have a sum of £255,351 available for reissue out of capital repayments during the year.

The total sum allotted to local authorities out of economic funds from the commencement of the Act up to 30th June, 1937, amounts to £5,973,902. In view of the increasing activities in housing matters on the part of local authorities the time is not far distant when, if the assistance rendered by the Government is to be continued, it will be necessary for further funds to be made available.

The total loan issues from economic funds during the period under review amounted to £285,246 of which the sum of £54,236 was from funds provided by the Treasury whilst the balance of £231,000 represents reissues out of capital repayments made by the Provincial Administrations.

Representations were made that owing to increased costs it was not possible to erect dwellings of a satisfactory design under the limits then operating and after consideration it was agreed that at those centres in which wages for the building industry are prescribed in terms of either the Industrial Conciliation Act, No. 11 of 1924, or the Wage Act, No. 27 of 1925, the limit in respect of the cost of constructing the dwelling, excluding the cost of the ground, be raised to £1,000 and the loan not exceeding 80 per cent of the cost of the house and ground up to a maximum of £950. At all other centres the limits were fixed at £900 for the cost of the dwelling with a maximum loan of £800.

With a view to further assisting local authorities to overcome their difficulties regarding the shortage of dwelling accommodation, the Government agreed to reduce the rate of interest charged on loans from economic funds from 4 per cent. to 3½ per cent. per annum.

Sub-economic Housing.—The Government's commitment in respect of sub-economic housing is £5,000,000* of which £689,100 has been issued up to 30th June, 1937. The total allotments to local authorities from sub-economic funds from the commencement of the Act amounts to £5,026,736 which includes the sum of £1,392,000 previously mentioned as having been allotted to Port Elizabeth Municipality, £100,000 to Johannesburg Municipality, £800,000 to Pretoria Municipality, £200,000 to Benoni Municipality whilst the balance is made up of varying sums allotted to several other municipalities. Issues from sub-economic funds during the year amounted to £321,852.

During the year the total value of loan applications approved amounted to £1,621,530 involving the erection or enlargement of 6,533 dwellings, details of which are as under:—

Economic housing (3½ per cent. loan funds), loans totalling £324,508. Number of dwellings involved, 904.

Sub-economic housing (¾ per cent. loan funds), loans totalling £1,297,022. Number of dwellings involved, 5,629.

The corresponding figures for the previous year are:

Economic housing, loans £224,512. Number of dwellings, 668.

Sub-economic housing, loans £166,634. Number of dwellings, 333.

Housing of the Aged Poor and Totally Unfit.—The small number of applications received under this scheme is disappointing. Many inquiries were received from local authorities and benevolent societies, but only three

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* It is to be noted that the whole of this amount has been allotted and the Government has since agreed to make available a further sum of £5,000,000 for sub-economic housing.

concrete proposals involving a total sum of £30,400 were received, namely, the Citizens Housing League Utility Company, Capetown, £9,400, Port Elizabeth Municipality, £20,000, and Dordrecht Municipality, £1,000, the latter being subsequently withdrawn. It is known, however, that other local authorities have under consideration the question of providing housing accommodation for persons of the class the scheme is intended to cater for.

Slum Elimination.—The Slums Act No. 53 of 1934 was extended during the year to seven additional centres comprising Barberton (Proclamation No. 224, dated 19th August, 1936), Paarl (Proclamation No. 225, dated 28th August, 1936), Somerset West (Proclamation No. 279, dated 6th November, 1936), Springs (Proclamation No. 288, dated 18th November, 1936), Worcester (Proclamation No. 305, dated 7th December, 1936), Benoni (Proclamation No. 46, dated 6th March, 1937), and Boksburg (Proclamation No. 61, dated 3rd April, 1937). The number of centres at which the Act is in force now totals 25.

During the year 14 appeals were lodged under section 4 (10) of the Act against the declaration of a single set of premises as a slum comprising 8 (involving 13 properties) from Johannesburg, 1 (1 property) from Capetown, 3 (involving 5 properties) from Beaufort West, 1 (1 property) from Port Elizabeth whilst 1 appeal (involving 1 property) from Randfontein was not lodged within the period stipulated by the Act and could not, therefore, be considered. Since the commencement of the Act up to 30th June, 1937, no less than 229 appeals (involving a total of 573 properties), excluding the appeal from Randfontein mentioned above, have been disposed of and of this number 178 (403 properties) were from Johannesburg, 11 (78 properties) from Capetown, 2 (4 properties) from East London, 33 (73 properties) from Durban, 4 (14 properties) from Beaufort West and 1 (1 property) from Port Elizabeth.

Thirteen applications for the Minister's approval in connection with the acquisition of land in terms of sections 17 and 18 of the Act were dealt with during the year, namely, 7 from Capetown, 1 from Graaff-Reinet, 1 from George, 1 from East London and 3 from Johannesburg in addition to which 1 application to acquire land under section 11 of the Housing Act (as amended) was received from Johannesburg. The Capetown Municipality submitted an application for the amendment of the conditions under which approval to the acquisition of land had previously been granted.

General.—The race for armaments in Europe has been felt in the Union by forcing up of the price of building materials and builders ironmongery. The increased costs have affected a number of schemes which had been drawn up by local authorities and, on tenders being called for, it was found that the tenders submitted were far in excess of the original estimated costs. In some cases the details of the schemes were revised and accommodation and costs cut down to the minimum whilst in other cases additional loans to meet the position were applied for.

A number of visits were made during the year to various centres by the technical members of the Central Housing Board who have collaborated on the spot with representatives of the local authorities and their staff in connection with the carrying out of schemes and housing matters in general. The Board has designed a number of types of dwellings suitable for occupation by the poorer classes of Europeans and also for occupation by non-Europeans. These dwellings have been designed with a view to reducing building costs to a minimum whilst at the same time providing the maximum amount of accommodation. Copies of the plans with a general specification and bills of quantities are available for distribution to local authorities on application. A large number of copies have already been distributed.

2. *Housing of Industrially Employed Non-Europeans in Natal.*—The systematic enforcement of regulations promulgated under Government Notice No. 615 of June, 1915, which deals with non-European Housing in Natal, begun in 1936, continues.

Progress has been steady and generally gratifying. The larger estates have for the most part agreed to a 3 to 5 year programme of building and reconstruction. In response to a departmental circular to all estates not yet inspected, numbers of estate owners have come forward voluntarily and submitted plans and specifications for approval.

Total number of estates inspected to date (30th June, 1937)	363
Estates notified but not yet inspected	497
Estates improving non-European housing without prior inspection	63
Number of estates which have had plans approved up to 30th June, 1937...	130

The last-mentioned figures include plans submitted by the leading miller-planters and other companies in Natal and Zululand who control large numbers of properties, and who are building to approved standard plans.

In September, 1936, authority was obtained from the Minister to refuse the erection of wood-and-iron buildings, unless as temporary barracks or under other special circumstances.

This action has had two important results. It has slowed down very considerably the rate of rehousing the non-European employees, owing to higher costs and lack of skilled builders. Secondly, it has raised the standard of rural housing so that it now compares very favourably with the best municipal urban non-European housing.

It is estimated that there are some 800 sugar-cane growing properties and that there are approximately 8,000 Asiatics and 38,000 Bantus employed thereon, making a total of 46,000 non-European employees. To this number must be added at least 32,000 dependents. This gives a total of 78,000 non-European labourers and the dependents living on estates. This figure is made up as follows:—

Bantu labourers	38,000	Dependents Nil.
Asiatic labourers	8,000	Dependents 32,000.
TOTAL	46,000	32,000
GRAND TOTAL	78,000	—

The housing of the Indians presents far greater difficulties than is the case with the Bantu, as the latter do not have their families with them. To meet this difficulty larger houses have to be built for the Indians, amounting in some instances to three-roomed cottages.

Returns for the amount of actual building and alterations done during the past twelve months, together with the number of persons actually rehoused, are now to hand, and the amount of building completed and in hand is considered satisfactory. This is set out in Tables O (i) and O (ii)).

TABLE O (i).—RECORD OF REHOUSING PROGRESS ON ESTATES IN NATAL AND ZULULAND UP TO THE YEAR ENDED 30TH JUNE, 1937.

Estates Inspected.	Plans Approved.	Houses Built or Altered.	Houses Demolished or Vacated.	Latrine Accommodation.
363	130 Estates.	2,888	1,295	470 pit closets. Two companies have water-borne schemes in hand.

TABLE O (ii).—NUMBER OF NON-EUROPEANS REHOUSED IN APPROVED HOUSES.

Natives.	Indians.	Dependents.	Total.
7,124	1,764	8,118	17,006

This is all the result of private enterprise in response to an appeal to estate owners combined with systematic effort on the part of the Department. The procedure adopted may be briefly outlined.

Each estate is inspected in detail and a list of the Department's actual requirements is forwarded to the estate concerned. This is followed up by reinspections and reminders and, in some instances, by legal pressure, until the requirements of the Department have been met. No Government financial assistance has been available to individual estate owners or to companies in this connection. Estate owners realised and willingly acknowledged that their non-European housing was bad and both the sugar and the wattle industries have embarked upon a rehousing campaign which is now in full swing.

3. *Rural and Peri-urban Sanitary Conditions.*—In the last two annual reports some consideration was given to the peri-urban problems of Natal. These accounts emphasised the insanitary conditions arising around the larger Natal municipalities due to uncontrolled "squatting" and development. An absence of local government for such areas has rendered adequate supervision extremely difficult.

The last year has again brought such problems into prominence, and attention has been directed to several aspects of semi-urban settlements. The so-called "black belts" of Natal have been described, and similar peri-urban aggregations of the Reef are at present being treated in the reports of the Johannesburg and Germiston Municipal Boundaries Commission presided

over by Mr. Justice Feetham. Rapid growth of the Reef population in recent years has resulted in a " spilling over ", whereby numerous communities have arisen outside the municipal areas. Such new communities have had as an unfortunate concomitant of their mushroom-like evolution little or no supervision or organisation.

As in Natal so in these areas the difficulties are largely to be ascribed to inadequate machinery for ensuring efficient local government. The extension of existing municipal boundaries will meet the needs of some areas but not others, more remotely placed. Another aspect of this problem of uncontrolled settlement and aggregation which escapes application of existing legislation lies in land hired out for building and " squatting ". Such settlements are springing up in many different parts of the country.

However, peri-urban and other semi-urban aggregations of populations do not complete the story of insanitary conditions lacking adequate control. Reports are increasing of unsatisfactory housing and living conditions of certain classes of rural workers, and of the unjustifiably low hygienic standards existing in many small rural communities both European and non-European.

These various small communities, peri-urban, " squatting " and rural, have similar problems of health and sanitation. There usually exist primitive nightsoil disposal, polluted water supplies, lack of refuse disposal, and unplanned and poor dwelling conditions. The nuisance sections of the Public Health Acts are available, it is true, for dealing with such conditions, but in areas where expert technical personnel is difficult to obtain such powers are extremely cumbersome in application. One solution offers in many cases, especially in the peri-urban and the more densely populated communities. This is the application of local government, either by establishing new bodies or by bringing the affected areas under existing local government control. This last measure has been recommended in the preliminary reports by Mr. Justice Feetham in the case of certain areas in proximity to Germiston. The need for better and extended local government units is being met to a certain extent in the Transvaal by a useful co-operation of the Transvaal Provincial Administration and this Department. During the last twelve months several joint inspections have been made by a local government inspector of the Provincial Administration and an assistant health officer of this Department. Local conditions are studied and usually meetings are held with local representatives to discuss ways and means of establishing or improving local government. Generally satisfactory results have followed, and a continuation of this joint action should remove some of the obstacles inherent in separate central responsibility for public health on the one hand and local government on the other.

It is generally agreed that in order to ensure a satisfactory standard of public health in a community it is essential that there should be a measure of local government. The Public Health Act provides for the administration of matters affecting the public health through and by means of local authorities. The fact, therefore, that local government in many parts of the Union and more particularly in the Province of Natal is still lacking in many communities militates against the attainment of a satisfactory standard of public health.

The establishment of local authorities is a function vested in the provincial administration. This Department has persistently pressed for the extension of local government as the only effective means of ensuring improved sanitation and public health measures, more particularly in the smaller urbanised communities.

The Province of Natal has been the most backward of the provinces in developing local government and had it not been for the malaria epidemic of 1932-33 the present conditions would have been much worse. In this respect Natal compares very badly with the Cape Province which has developed local government both urban and rural to a greater extent than any of the other provinces.

Unfortunately the provincial administration whose function it is to create local authorities appears unable to do more than sanction the establishment of local government when requested to do so by the community concerned. Moreover, when an established local authority is desirous of incorporating a community on its border, which menaces its wellbeing, but which is unwilling to be incorporated, the provincial administration appears to be seldom able to incorporate such a community against its wishes even when such incorporation is urgently necessary on public health grounds.

This is the main contributory cause in the development of the unsightly and insanitary " black belt " surrounding many of the larger towns and villages in Natal.

It is usually contended that the incorporation of a " black belt " by a local authority will cause the inhabitants to " up sticks and shift over the

new border ''. This has not, however, proved to be the case in centres where such incorporation has been carried out.

Another factor which retards the development of local government is the differential system of licensing in respect of urban and rural areas. Thus in the case of a village which becomes a health committee area the local butcher finds that he has to pay an annual licence fee of £7. 10s. instead of the former £2. 10s. fee. The hotelkeeper's licence fees are similarly increased from £15 to £37. 10s. There is thus an inevitable hostility created by such individuals (who are often very influential members of the community) against the establishment of a local authority. There would seem to be a case for the amendment of the law in this respect in order that communities having the status of health committees should be rated on the lower basis in respect of licensing fees. After all, the establishment of a health committee, which is a necessity on public health grounds, does not convert such a community into a town.

Where statutory local bodies have been established marked progress in the sanitation and public health of the community has almost invariably been noted. A spirit of local responsibility is developed in the community which manifests itself in improvement of essential services and in the local amenities.

There are, actually, many inland communities in Natal such as Kloof, Hillcrest and Camperdown, where increasing urbanisation is so far advanced that the institution of local health control in the form of a statutory local authority should no longer be delayed, if the community health is to be safeguarded. The same applies to various rapidly developing coastal communities such as Anerley, Sea Park, Uvongo, St. Michaels-on-Sea, Southbroom and the peri-Margate area which are advertising themselves as health resorts, and are attracting annually large numbers of up-country visitors, but where no local control of essential sanitary and public health services exists. In these latter communities especially, the absence of statutory local bodies is fraught with serious danger to the health, not only of the permanent local residents, but also that of the unsuspecting visitors.

It is not, of course, the duty of this Department to provide essential sanitary services for a community, but the Department would be failing in its duty if it did not draw attention (as it has done repeatedly in the past) to the dangerous conditions which are developing in these uncontrolled communities. Dangerous conditions are in fact developing so fast that there would seem to be a case for the appointment of a commission by the Government to study the whole problem as it exists to-day in Natal.

There is a Townships Board in Natal. This body has already done good work in the short time during which it has been functioning, but unfortunately it can do nothing to undo the evils evident in some of the badly planned townships already created. The personnel of the Townships Board does not include a public health officer to advise on the important aspects of public health. The present members of this Board apparently realise the need for expert guidance on health matters and have on occasions invited representatives of this Department to attend some of their meetings, but it is obvious that an experienced Government or municipal health officer or medical officer of health should be a permanent member of this Board.

In the Cape the existence of rural local units, the divisional councils, provides a channel for local sanitary legislation to meet most needs, but the continued absence of such bodies in the other provinces has meant a serious defect in securing simple sanitary powers to deal with such matters as nuisances. The defect has been revealed more particularly in the peri-urban areas of the Reef, in areas near Pretoria and in certain areas at Henneman in the Free State, in addition to the Natal instances described above. It has now been decided to promulgate under the Public Health Act simple sanitary regulations to be in force throughout the rural areas of the Union. This legislation, until such time as the more desirable extension of local government has been achieved in Natal, the Free State and the Transvaal, will at least put into the hands of magistrates a most useful instrument for removing the more glaring and gross forms of insanitation and nuisance.

By such regulations, effective action will be possible against authors of nuisances existing in the settlements of Mooiplaas at Pretoria, the Reef peri-urban settlements, the " skoonplaats " around the Natal coalfields, and squatting communities around many industries and farms in both the Free State and the Transvaal. The Department hopes that improvements in semi-urban communities will follow the promulgation of the proposed sanitary regulations.

Generally little action has been possible in regard to living conditions and the sanitary environment of rural agricultural workers and of kraal communities. Factors of education, staff and legislation enter into any policy of advancing the hygienic development of such peoples. Nevertheless it is nothing short of disgraceful that labourers employed by so many agriculturists

are allowed to live in conditions both squalid and insanitary. The housing and living conditions of farm labourers have scarcely received the attention they deserve, but this omission the Department hopes to rectify by instituting inspections of certain rural areas in the near future. Neglect of the standard of living of their employees is an extremely short-sighted policy on the part of many farmers and rural industrialists. Suitable conditions of employment, if provided, would both remove many labour troubles and act as a safeguard to the farmer against infectious disease attacking both himself and his stock. Typhus, plague, and enteric in human beings, and " measles " in cattle may be instanced as diseases likely to be considerably less of a menace in rural areas, if Natives had better living and sanitary conditions. These are aspects which will doubtless be inquired into by the recently appointed Commission on the shortage of farm labourers.

The Native Land and Trust Acts are likely to have momentous consequences on the social and community life of the Natives. New medical and health problems are likely to arise, for which reason this Department has considered it expedient to hold an early joint conference with the Department of Native Affairs in examining the situation.

Other approaches being made to establish better medical and health services in communities in Native territories are described in the sections on Propaganda and Venereal Disease in this report.

4. *Health Education and Propaganda.*—For more than a year the need for placing health propaganda and education on a better basis in this country has been under consideration. In the past such fields have been very incompletely and haphazardly treated. The Department has gradually compiled a series of pamphlets and collected a small number of films, while its technical officers are instructed to use every opportunity for discussion and demonstration of health facts and procedures. With the appointment of more wholetime medical officers of health opportunities for undertaking propaganda by local authorities in the larger centres are increasing. Active agents in dispensing valuable knowledge, particularly in the smaller centres, have also been such societies as the South African Red Cross Society, the South African Native and Coloured Health Society, the Council for Combating Venereal Disease, St. John Ambulance Association, National Cancer Association and many others.

A common policy and active co-ordination have been somewhat lacking and in the past it has not been possible to give the subject the important emphasis demanded of health education in modern preventive medicine. The need for more intensive effort has become increasingly obvious in the rural and Native communities, while a higher standard of personal hygiene and health knowledge is generally more desirable. The attainment of both personal and community well-being is peculiarly dependent upon individual ambition and action, and such progress is more soundly achieved through guidance and co-operation than through compulsion.

With these general principles in mind the Department early in the year submitted a memorandum on health education to the Council of Public Health which included the following statement:—

" Suggestions for Extension of Health Education and Propaganda

The Department seems to have three methods available:—

(i) Undertake its own propaganda.
(ii) Delegate propaganda entirely to some subsidised voluntary organisation.
(iii) Undertake its own propaganda in technical fields and certain specific subjects, but delegate all general propaganda to a voluntary organisation.

It is recommended that (iii) be adopted along the following lines:—

I. *Delegation of Propaganda.*

In the absence in South Africa of a national organisation of health education, it seems that the South African Red Cross Society is best suited for organising propaganda. On the basis of an increased grant from the Department it should be invited to undertake on a wide scale:—

(*a*) Preparation of posters, pamphlets, leaflets and other educational material.

(*b*) Organise health campaigns and assist local authorities and other organisations in health weeks, exhibitions, etc.

The subjects most suited to this general health programme of such an organisation as the Red Cross would include:—

(i) Cleanliness.
(ii) Physical fitness.
(iii) Personal hygiene.
(iv) Simple sanitation.
(v) Food and water.
(vi) Social and sex hygiene.

It seems most satisfactory to have this delegated function under the aegis of one organisation in securing uniformity, perspective, accuracy and the avoidance of overlapping. The fulfilment of the function to the satisfaction of the Department could be ensured by a departmental representative on a Propaganda Committee of the Red Cross Society and by the presentation of annual reports.

II. *Departmental Activities.*

It is suggested that with the delegation of general health propaganda to some such organisation as the Red Cross Society, the Department should limit itself to the distribution of material and information in the more technical and professional fields:

(*a*) *Posters, pamphlets, leaflets and circulars* being prepared and distributed as at present.

An extension of this could usefully be the issue by the Department of an occasional bulletin with information collected and collated from recent literature and from independent investigation considered of interest and importance to health officers in South Africa. This would be following the example of the United States Public Health Service and the English Ministry of Health. There seems, with the recent increase of local medical officers of health every likelihood of such a service being of great importance and assistance.

(*b*) *Films:* Considerable development is taking place in South Africa in this field, of which the recently constituted Film Advisory Board and Film Division of the Union Education Department are evidences. Film education is being planned to take a more prominent place in schools, normal colleges, agricultural and church organisations. Several municipalities have also indicated their interest. In keeping with international practice this development is in the 16 mm. field, and projectors and films of this type are to be used extensively.

It is, therefore, suggested that the Department not only increase and maintain its 35 mm. film library, but also establish a 16 mm. library, which will not only be considerably cheaper, but will reach selected audiences of school children, which, experience has shown, are more receptive to instruction under these educational conditions than general audiences in the usual cinemas."

This memorandum was considered by the Council of Public Health at its meeting in January, 1937, and its proposals were broadly agreed to and recommended for adoption. Negotiations were then initiated with the South African Red Cross Society, and arrangements are now approaching completion, whereby general health propaganda will be undertaken by this Society on a comprehensive scale which will, of course, be largely dependent on the subsidy voted by Parliament. This Society in co-operation with local authorities and the Department has also already moved in another important field of health education, viz. social hygiene. A medical officer was sent overseas to acquaint himself with modern methods of social hygiene propaganda, and it is planned to employ him firstly in the Native territories where the need for such instruction is greatest.

The proposals of the memorandum in regard to films are being adopted, the first large batch of 16 mm. health films for the Department now being on order, and the 35 mm. library is being overhauled, and extended. As the first move towards a system of technical bulletins and circulars the Department is also improving its library service.

The Department loses no opportunity of emphasising the importance of hygiene as a subject in the curricula of all educational institutions, and several useful conferences with the Educational authorities are slowly achieving this purpose. There can be no question but that the provincial education departments have made very satisfactory advances in this connection in recent years.

5. *Infant Welfare.*—The European infantile mortality rate for the calendar year 1936, for the whole of the Union was 59·06 per thousand births, the lowest yet recorded, as will be seen from Table P (i). The figures for the Natal Province show an increase over those of the previous year from 48·53 to 52·41 whereas in the remaining three provinces there have been notable decreases. The Transvaal Province still records the highest number of deaths, viz. 65·52 per thousand births.

TABLE P (i).—EUROPEAN INFANTS: BIRTHS AND DEATHS UNDER ONE YEAR REGISTERED AND INFANTILE MORTALITY RATE, I.E. DEATH RATE PER 1,000 BIRTHS, 1919–1936.

Year.	Cape.			Natal.			Transvaal.			Orange Free State.			Union.		
	Total European Births Registered.	Deaths of European Children under One Year.	Death-rate per 1,000 Births.	Total European Births Registered.	Deaths of European Children under One Year.	Death-rate per 1,000 Births.	Total European Births Registered.	Deaths of European Children under One Year.	Death-rate per 1,000 Births.	Total European Births Registered.	Deaths of European Children under One Year.	Death-rate per 1,000 Births.	Total European Births Registered.	Deaths of European Children under One Year.	Death-rate per 1,000 Births.
1919	16,749	1,351	80·66	2,910	191	65·64	15,338	1,326	86·45	4,727	382	80·81	39,724	3,250	81·81
1920	18,425	1,654	89·77	3,256	235	72·17	16,768	1,576	93·99	4,996	448	89·67	43,445	3,913	90·07
1921	18,062	1,382	76·51	3,370	203	60·24	16,582	1,374	82·86	5,288	379	71·67	43,302	3,338	77·09
1922	18,248	1,294	70·91	3,294	180	54·64	16,370	1,292	78·92	4,920	357	72·56	42,832	3,123	72·91
1923	18,296	1,353	73·55	3,229	197	61·01	15,619	1,261	80·74	5,037	328	65·12	42,181	3,139	74·42
1924	18,730	1,296	69·19	3,410	273	80·06	15,287	1,171	76·60	4,919	382	77·66	42,346	3,122	73·73
1925	18,366	1,343	73·12	3,509	206	58·71	16,348	1,059	64·78	5,188	361	69·58	43,411	2,969	68·39
1926	18,675	1,196	64·04	3,588	189	52·68	16,304	1,186	72·74	5,309	273	51·42	43,876	2,844	64·82
1927	18,537	1,293	69·75	3,435	166	48·32	17,050	1,359	79·71	5,325	314	58·97	44,347	3,132	70·63
1928	18,032	1,240	68·77	3,514	184	52·36	17,949	1,370	76·33	5,318	365	68·63	44,813	3,159	70·49
1929	19,008	1,169	61·50	3,650	177	48·49	18,227	1,342	73·63	5,334	280	52·49	46,219	2,968	64·22
1930	19,468	1,332	68·37	3,641	159	43·65	19,108	1,386	72·54	5,317	300	56·42	47,534	3,177	66·84
1931	19,180	1,182	61·63	3,538	162	45·79	18,733	1,267	67·65	4,975	317	63·72	46,423	2,928	63·07
1932	18,284	1,205	65·90	3,373	204	60·48	18,376	1,402	76·30	4,911	271	55·18	44,944	3,082	68·57
1933	17,931	995	54·49	3,441	166	48·24	18,452	1,266	68·61	4,695	299	63·68	44,519	2,716	61·01
1934	17,642	1,022	57·93	3,310	157	47·43	19,327	1,279	66·18	4,599	270	58·71	44,878	2,728	60·79
1935	18,242	1,016	55·70	3,441	167	48·53	21,109	1,537	72·81	4,925	277	56·24	47,717	2,997	62·81
1936	18,162	980	53·96	3,606	189	52·41	22,192	1,454	65·52	4,670	249	53·32	48,630	2,872	59·06

The statistics available only concern European children as the work carried out in connection with infant welfare is mainly directed to that section of the population. In certain of the larger towns of the Union where infant clinics are conducted on well organised lines, some provision is made for the non-European child as well. In the smaller towns and rural areas this aspect of the work is seldom seriously tackled. It is hoped, however, that with the extension of the district nursing services, which is taking place, it will be possible, in time, to make satisfactory provision for both the European and non-European sections of the community.

The statistics at present available in regard to births, deaths, infantile mortality, neo-natal mortality, abortions, still-births, and maternal mortality and morbidity, are inadequate. Notifications of births and deaths in respect of the non-European population are not yet required by law, except in certain municipal areas, and it is considered that this important question deserves early consideration.

It is impossible, owing to lack of statistics, to estimate the non-European infantile death-rate in the Union as a whole, but there can be no doubt whatever that it is appallingly high, and it is known that the general standard of physique among these children, once they pass the period of infancy and breast feeding, is often very low.

The organisation of infant clinics in small towns presents many practical difficulties, and few places are fortunate in obtaining the services of a district nurse who has had any experience in establishing and running clinics. The first principle to be grasped is that the objects of these clinics are preventive and advisory and not curative. Their purpose is to see that the healthy child continues to be healthy; they should act as guiding centres, picking out the sick child and passing it on for proper medical attention.

Clinics should, where possible, have a medical officer in attendance, and every effort should be made to obtain the co-operation of the medical profession in the conduct of these clinics. Where a doctor is not available, the chief function of an infant clinic should be to furnish advice on infant feeding, and in this respect invaluable service has been done by the nurses and midwives trained in mothercraft.

The National Council for Child Welfare is always prepared to furnish assistance in establishing infant clinics, and for this purpose has an itinerant nurse, part of whose duty it is to visit new centres and assist in the organisation of this work.

The Department gives advice where it can through its inspecting nurses, but the staff originally appointed as organisers is now required to devote most of its time on inspectional duties.

6. *Maternal Mortality.*—The incidence of puerperal sepsis in the Union is unnecessarily high; it is also probable that this incidence is actually higher than would appear from available statistics owing to the fact that many cases of this disease are not recorded because of incorrect notification. Numbers of instances of this disease have been traced by the Department to cases which have been attended by untrained midwives or " gamps ".

TABLE P. (ii).—MATERNAL MORTALITY: EUROPEANS.

Year.	Live Births Registered.	Deaths due to Puerperal Causes.				
		Number.		Rates per 1,000 Live Births.		
		Puerperal Sepsis.	Other Puerperal Causes.	Puerperal Sepsis.	Other Puerperal Causes.	Total Puerperal Mortality.
1926.....	43,876	88	112	2·06	2·50	4·56
1927.....	44,347	101	112	2·28	2·53	4·81
1928.....	44,809	102	121	2·28	2·70	4·98
1929.....	46,219	140	103	3·03	2·23	5·25
1930.....	47,536	119	131	2·50	2·76	5·26
1931.....	46,423	116	102	2·50	2·20	4·70
1932.....	44,944	126	113	2·80	2·51	5·31
1933.....	44,519	113	101	2·54	2·27	4·81
1934.....	44,878	121	148	2·69	3·30	5·99
1935.....	47,717	119	107	2·49	2·24	4·73
1936.....	48,630	116	132	2·39	2·71	5·10

It is admitted that there is a shortage of trained midwives, particularly in the rural areas, but it is hoped that, before long, this shortage will, to a certain extent, be overtaken and that expectant mothers will be enabled to have the benefit of trained assistance.

Meddlesome midwifery is probably to blame for most of the tragedies of child-birth, and when it is backed up by dirt and ignorance, the distressing results are not to be marvelled at.

The present legislation controlling midwifery applies only to urban local authorities, and to such rural local authorities to which it has been made applicable by special proclamation. So far only one rural local authority has been included, the Divisional Council area of the Cape, which has a full-time medical officer of health.

The South African Medical Council's rules for midwives apply throughout the Union, and only two areas, namely, the urban areas of Pretoria and Bloemfontein, have so far been proclaimed as areas in which only qualified midwives may practise.

In considering the question of maternal mortality, one of the greatest difficulties which faces maternal welfare work in this country is the lack of suitable accommodation for the normal pauper or part-paying maternity case. The paying case can in most instances be catered for: The provincial hospitals are willing to admit her, for a fee; private nursing homes will admit her, or she can pay for the services of a trained midwife either with or without a doctor, who can attend her in her own clean and comfortable home. But what of the poor woman who lives in a tiny hovel, sharing a room and possibly a bed with other members of the family, often amid dirt, squalor and poverty which make the lot of the district midwife and the chances of a safe child-birth anything but favourable? How much of our puerperal sepsis is due to this cause?

The evil is greatest in small country towns, where the hospital will not admit non-paying normal cases, even if its beds are half empty, as is frequently the case. Where is the poor but decent farmer's wife to go if she comes to the town to be served by doctor and midwife? There may possibly be a nursing home on a very small scale run by a trained midwife, but many of these women cannot afford the fees, and the result is that cases are admitted to unregistered and unsuitable premises, where they are attended by untrained women, often with a hospital and a district nurse at hand.

Should provincial hospitals be enabled to provide accommodation for this type of case, an improvement in the maternal mortality and morbidty of the Union, and of its health as a whole would almost certainly result. The Department meanwhile has proposed to the committees at places where district nurses are stationed and where no satisfactory provision otherwise has been made, that they should establish at each centre not more than two beds so that the district nurse may be able to deal with maternity or emergency cases occurring in her area. But the success of such a scheme in any province must depend on whether the Provincial Administration concerned is willing to assist financially those patients who are not able to pay the whole cost of maintenance themselves. Obviously such cost cannot be left to be borne by the nurse. It seems probable that in the Transvaal, at any rate, such an arrangement may be sanctioned generally in the near future. In the Cape Province suitable arrangements could lawfully be made under the Charitable Institutions Ordinance of that Province.

Table P (iii).

Causes.	European Deaths from Puerperal Causes—1935. (According to Age Periods.) All Ages.	15–19.	20–24.	25–29.	30–34.	35–39.	40–44.	45 and Over.	European Deaths from Puerperal Causes—1936. (According to Age Periods.) All Ages.	15–19.	20–24.	25–29.	30–34.	35–39.	40–44.	45 and Over.
Post Abortive Sepsis	23	1	4	7	5	6	—	—	27	—	6	10	6	4	1	—
Abortion—not returned as Septic	8	—	1	—	3	3	1	—	8	—	2	2	2	1	1	—
Ectopic Gestation	12	—	—	4	1	3	4	—	13	1	1	4	4	3	—	—
Other Accidents of Pregnancy	2	—	—	—	—	1	—	1	3	—	—	1	1	—	1	—
Puerperal Haemorrhage	22	3	4	4	4	3	2	2	30	1	5	9	4	5	5	1
Puerperal Sepsis	96	5	20	24	19	20	7	1	89	9	24	22	15	11	7	1
Puerperal Albuminuria and Convulsions	22	1	4	5	4	4	4	—	32	1	9	8	8	2	4	—
Other Toxaemias of Pregnancy	11	1	3	2	3	2	—	—	5	—	2	1	2	—	—	—
Puerperal Phlegmasia—Alba Dolens, Embolism and Sudden Death	8	—	1	1	3	1	2	—	10	2	—	3	3	2	—	—
Other Accidents of Childbirth	20	—	1	6	4	4	5	—	28	—	8	5	8	5	2	—
Other or Unspecified conditions of the Puerperal State	2	—	1	—	—	1	—	—	2	—	1	—	1	—	—	—
Puerperal Diseases of the Breast	—	—	—	—	—	—	—	—	1	—	—	1	—	—	—	—
Total	226	11	39	53	46	48	25	4	248	14	58	66	54	33	21	2

7. *Mothers' Clinics.*—The second meeting of the South African National Council for Birth Control was held at Pretoria on the 6th and 7th October, 1936. As a result of this meeting the name of the Council was changed to "South African National Council for Maternal and Family Welfare". The following resolutions were adopted by the meeting:—

> "This conference having due regard to the morbidity and mortality associated with child-bearing in South Africa and the accentuation of the social problem created by excessive families amongst the poor—
>
> (1) believes that the National Health programme should be strengthened by the establishment throughout the Union of Mothers' clinics;
>
> (2) considers that such clinics should—
>
> (*a*) provide or arrange appropriate medical or surgical treatment for all women suffering from gynaecological ailments who would be unable otherwise to secure such treatment;
>
> (*b*) instruct married women in family spacing and, in the case of those who are temporarily or permanently unfit to bear children, in the principles of birth control;
>
> (*c*) be subsidised by the Department of Public Health which should be empowered to make grants-in-aid to local authorities or voluntary organisations establishing and maintaining such clinics to the satisfaction of the Department; and
>
> (3) recommends that adequate provision be made on the departmental estimates accordingly."

A growing recognition of the necessity for these clinics is further illustrated by the fact that at the Annual Congress of the "Suid-Afrikaanse Vroue Federasie" held at Ermelo in 1937, the following resolution was passed:—

> "That the moral and, if possible, tangible support of the "Suid-Afrikaanse Vroue Federasie" is requested for mothers' clinics where mothers could be better educated regarding the proper spacing of babies and the Government is respectfully requested to establish and promote such clinics."

Clinics are at present in existence at Capetown, Port Elizabeth, Durban, Pietermaritzburg, Johannesburg, Pretoria and Benoni; the Port Elizabeth Society does a certain amount of rural work by conducting regular clinics at Uitenhage and at Kirkwood.

The Department is making representations to the Treasury with a view to the authorisation of a grant-in-aid towards the expenditure incurred by the Council in its conduct of such clinics.

8. *District Nursing.*—There are now 170 European, Coloured and Native nurses, midwives, or Native nursing assistants, who are being subsidised by the Department in terms of sections 14 and 15 of Act No. 57 of 1935. The Department has agreed to subsidise a further 45 appointments, but these have not as yet materialised owing to the prevailing shortage of nurses and the difficulty in obtaining persons willing to work in outlying areas.

The inspectors of nursing attached to the Department tour the country extensively giving advice to newly formed nursing centres and inspecting the work already carried out. They inspect also the nursing homes in the rural areas and smaller centres. It is probable that a larger staff than that at present available may have to be employed on this work.

The following hospital boards have so far instituted district nursing or midwifery services:

Cape: Albany, Barkly West, Cape, East London, George, Kimberley, Oudtshoorn, Port Elizabeth, Somerset East, Worcester.

Natal: Addington Hospital, Durban; King Edward VIII. Non-European Hospital, Durban; and Grey's Hospital, Pietermaritzburg.

Orange Free State: Bloemfontein, Kroonstad, Ladybrand, Senekal.

No provision had previously been made by the Cape Provincial Administration for the payment of a suitable salary to midwives who could be employed on district midwifery services. At its recent session the Cape Provincial Council, however, passed the necessary legislation covering this omission and as a result thereof a number of the hospital boards has been enabled to appoint district midwives. This amendment in the law, although a step forward in meeting difficulties which have become apparent, does not

obviate all these difficulties. No provision has, for instance, been made for a salary scale for non-European nurses or midwives, and in many instances a Native district midwife is more urgently needed than a European one. At present such an appointment is not a practical proposition for a hospital board and any appointment of Native nurses has to be made by a charitable organisation or mission.

In the Transvaal the Provincial Administration also has under consideration the question of amending its hospital ordinance to allow of the appointment of district nurses and midwives, and it is hoped in the near future that appointments of this nature will be made in all towns in the Transvaal where there are provincial hospitals. Such an amendment would also permit of the District Nursing Association of Johannesburg being taken over and controlled through the Johannesburg General Hospital.

There has been a number of new appointments made by charitable societies, etc., under section 14 (*a*) of the Act. The Cape Province has benefitted to a greater extent than the other provinces owing to the provisions of the Charitable Institutions Ordinance of that Province which enables local charitable institutions to be formed and to receive financial assistance, not made to similar institutions in the remaining provinces, in the employment of district nurses.

Newly formed societies in communities where there has not previously been a nurse, find it difficult to draw up a satisfactory constitution, and are constantly appealing to the Department for guidance in doing so. It is hoped before long to draw up a series of suggestions embodying rules regarding the nurse's duties, the leave to which she is entitled and the conditions under which she is to work, and these will be made available as a guide to charitable associations, leaving it to their discretion to make amendments, where necessary, according to local circumstances.

Experience has proved that if a new service is to work smoothly and be successful it is of the utmost importance to obtain, at its inception, the co-operation of the doctors and private nurses, if there are any such in practice locally. It is also obvious that the services of a district nurse should be available to all sections of the same community, regardless of class, colour or creed.

Appointments of subsidised nurses continue to present many difficulties. The idea has unfortunately got abroad that, because the Government has subsidised a district nurse, her services are available to all and sundry free of charge. In numbers of centres where subsidised nurses are stationed this has been found to be the case and the Department has lost no time in informing the communities that persons requiring the services of a nurse are expected to pay therefor according to their financial ability. Where persons are not in a position to contribute towards the services of the nurse, such services will be rendered without charge and this is one of the objects of the payment of a subsidy to a nurse.

There has been very little expansion in connection with the appointment of nurses by charitable organisations, etc., in Native areas. A number of missionary societies are beginning to form themselves into charitable organisations to enable them to receive the benefits provided by law.

The Department has recently authorised the payment of subsidies to Native nurses or Native nursing assistants to enable them to work in the Native areas.

The following tables illustrate the growth of the district nursing movement in terms of sections 14 and 15 of the Act from its inception up to 28th July, 1937:—

A. *As at 31st December*, 1935.

Section of Act.	European.	Native.	Coloured.	All Races.
Part-refunds under section 14 (*a*)..	23	2	—	25
Subsidies under section 14 (*b*).....	7	—	1	8
Part-refunds under section 15 (*a*)..	—	11	—	11
Subsidies under section 15 (*b*).....	—	3	—	3
TOTALS.....	30	16	1	47

B. *As at 30th June*, 1936.

Section of Act.	European.	Native.	Coloured.	All Races.
Part-refunds under section 14 (*a*)..	37	2	—	39
Subsidies under section 14 (*b*).....	26	—	2	28
Part refunds under section 15 (*a*)..	—	16	—	16
Subsidies under section 15 (*b*).....	—	7	—	7
TOTALS.....	63	25	2	90

C. *As at 30th June*, 1937.

Section of Act.	European.	Native.	Coloured.	All Races.
Part-refunds under section 14 (*a*)..	65	3	4	72
Subsidies under section 14 (*b*).....	51	—	4	55
Part-refunds under section 15 (*a*)..	6	25	—	31
Subsidies under section 15 (*b*).....	2	10	—	12
TOTALS.....	124	38	8	170

9. *Shortage of Nurses.*—Shortage of trained nurses and midwives continues to be an acute problem and as far as district nursing is concerned, the result is that nurses seek a change from one subsidised post to another always in search of what may be considered a better post. It is often an extremely difficult matter, when new areas are under consideration, to decide as to what would be a reasonable subsidy sufficient to retain nurses in such areas. There is an urgent need for the importation of about 250 trained nurses from overseas to make up the deficiency in the local supply.

10. *Nursing Homes.*—The standard of nursing homes in the Union varies considerably. It is difficult to fix minimum standards which have to vary according to circumstances. As a result of inspections these homes, many of which were originally very unsatisfactory, are being gradually improved. It has been found necessary to amend the Nursing Homes Regulations in several respects, namely:—

(1) To enable the Minister to restrict the scope of certain classes of homes.

(2) To permit of the delegation of authority for the inspection of homes by full-time medical officers of health and registered nurses attached to the staff of certain local authorities.

(3) To bring the maternity register prescribed by this Department in its "Regulations for Persons Practising Midwifery" into line with that prescribed by the South African Medical Council in its "Rules for Midwives".

Registrations.—During the year ended 30th June, 1937, a total of 52 nursing establishments was reported closed against 70 for the previous year, while 61 new registrations were effected during the same period compared with 56 for the previous year. Some of the new registrations include the transfer of old establishments to new premises. The total number of registered nursing and maternity homes in the Union as at the date mentioned was 338, compared with 316 for the previous year. From the accompanying Table Q (i) it will thus be seen that steady progress has been maintained during recent years. Not only is this the case as far as actual numbers are concerned, but especially in respect of the standards applicable to such places as referred to in subsequent paragraphs.

Registrations effected during the past nine years, 1928-1937:—

TABLE Q (i).—NURSING HOMES REGISTERED WITH THE DEPARTMENT.

Year.	Cape.	Transvaal.	Natal.	Orange Free State.	Total.
1928–29.....	104	90	43	26	263
1929–30.....	124	91	54	29	298
1930–31.....	110	98	51	25	284
1931–32.....	95	94	44	26	259
1932–33.....	105	100	46	25	276
1933–34.....	115	103	43	28	289
1934–35.....	126	128	42	28	324
1935–36.....	120	116	46	34	316
1936–37.....	134	120	49	35	338

More so than in almost any previous year better standards of staffing accommodation, hygiene and sanitation have been stressed by the nursing inspectors of the Department in their routine inspections. Past inspections have yielded satisfactory results inasmuch as actual progress has been checked up. Much valuable work has been done by the Department's nursing inspectors in this respect.

Inspections.—With only three nursing inspectors on the staff of the Department, one of whom was absent overseas for the purpose of post-graduate study in public health, it meant that, with the assistance of the Medical Inspector (Child Welfare) the area of the Union was satisfactorily covered during the year as far as inspections of nursing establishments were concerned as is reflected in Table Q (ii) which shows in comparative figures that, even with one short on the inspecting staff, the rate of inspections was well maintained. Particularly satisfactory also is the number of inspections carried out by full-time medical officers of health of the larger urban areas which for the current year has reached a maximum, which is very gratifying indeed.

TABLE Q (ii).—NURSING AND MATERNITY HOMES INSPECTED DURING THE YEARS ENDED 30TH JUNE, 1933, 1934, 1935, 1936 AND 1937, RESPECTIVELY.

Place.	Inspections.									
	By Medical Officer of Local Authority.					By Department and Other Government Officer.				
	1933.	1934.	1935.	1936.	1937.	1933.	1934.	1935.	1936.	1937.
Cape Province.										
Capetown	8	4	1	4	7	—	—	—	—	—
East London	—	—	2	4	4	—	—	3	—	—
Port Elizabeth	7	8	1	8	14	—	—	—	—	—
Elsewhere	2	9	2	—	3	—	5	49	34	81
Natal Province.										
Durban	1	—	19	—	11	—	—	—	—	—
Pietermaritzburg	1	1	3	—	3	—	—	—	—	—
Elsewhere	2	—	—	—	—	—	9	9	24	2
Transvaal Province.										
Johannesburg	2	1	35	2	54	—	—	—	—	2
Pretoria	1	—	11	5	13	—	—	—	—	—
Elsewhere	2	5	1	1	5	14	45	32	65	30
Orange Free State.										
Bloemfontein	—	1	—	—	—	—	—	—	—	—
Elsewhere	1	—	—	—	—	1	9	10	29	8
Union	27	29	75	24	114	15	68	103	152	129

The more important features advocated during the year's inspections were the remedying of sanitary defects.

Statistical.—Table Q (iii) shows approximate and comparative statistics of patients treated in the nursing establishments registered with this Department for the year ended 30th June, 1937:—

TABLE Q (iii).—PATIENTS TREATED AND CASES HANDLED BY NURSING HOMES FOR THE YEAR ENDED 30TH JUNE, 1937, COMPARED WITH THE TOTALS FOR THE YEAR ENDED 30TH JUNE, 1934.

Service.	Europeans.		Coloureds.		Natives.		Asiatics.		Total.	
	1934.	1937.	1934.	1937.	1934.	1937.	1934.	1937.	1934.	1937.
Admissions	34,841	38,995	686	806	5,498	8,006	663	304	41,688	48,111
Discharges	31,656	40,357	625	784	5,089	7,389	617	279	37,987	48,809
Deaths	1,014	938	11	19	304	495	37	24	1,366	1,476
Operations	20,415	18,613	16	56	505	1,361	43	40	20,979	20,070
Confinements	5,114	7,280	447	558	1,000	1,117	174	68	6,735	9,023
Patients nursed outside home	1,526	1,821	82	611	35	6,192	152	33	1,795	8,657
Confinements attended outside home	1,476	1,843	471	933	144	1,376	59	326	2,150	4,478
Deaths of Infants	—	139	—	22	—	48	—	11	—	220

Bed Accommodation.—Bed accommodation in the homes authorised by the Department is given in Table Q (iv), and an endeavour has been made to distinguish between the number of beds available for Europeans and non-Europeans; hence the differences in totals (for Europeans) as compared with previous years.

TABLE Q (iv).—BED ACCOMMODATION AVAILABLE IN NURSING HOMES.

	1934.	1935.	1936.	1937.
Cape Province—				
Capetown and Peninsula	—	476	527	556
East London	—	56	59	42
Port Elizabeth	—	129	139	111
Queenstown	—	44	58	58
Stellenbosch	—	58	34	35
Rest of Province	—	349	340	377
				92*
TOTALS	1,064	1,112	1,157	1,271
Transvaal Province—				
Johannesburg	—	683	638	689
Rand Municipalities	—	238	248	248
Pretoria and District	—	125	142	160
Rest of Province	—	188	230	188
				137*
TOTALS	1,044	1,234	1,258	1,422
Natal Province—				
Durban	—	326	522	385
Pietermaritzburg	—	108	113	35
Rest of Province	—	603	454	142
				489*
TOTALS	1,044	1,037	1,099	1,052
Orange Free State—				
Bloemfontein	—	68	59	72
Rest of Province	—	123	151	162
TOTALS	180	191	210	234

* Native.

It will be observed that progress here has been satisfactory also, especially in the Transvaal. Apparently the Orange Free State has still to make some headway as compared with the other provinces in respect of beds for non-Europeans.

11. *General Hospitals.*—During the year the system of routine inspection on behalf of the Provincial Administration of the state-aided hospitals and kindred charitable institutions in the Cape Province, Orange Free State and the Transvaal was continued. As in previous years, the public hospitals on the Reef and in Pretoria were inspected by the members of the Public Hospitals Advisory Council, while eighteen hospitals and aided charitable institutions were inspected and reported on by assistant health officers of the Department as opportunity arose. Owing to a shortage of professional officers, it was found impracticable to inspect all the institutions in the three Provinces mentioned during the year under review, but the inspections will be systematically continued and it is anticipated that no institution will be left for too long without a routine inspection by an assistant health officer. It is satisfactory to note that, generally speaking, considerable activity continues throughout the Union in modernizing the existing hospitals and in carrying out extensions to meet the increased demands for hospital accommodation. The hospitals in Natal are State institutions, with the exception of one which is subsidised, and are not inspected by assistant health officers of this Department.

In the Cape Province the new general hospital in Capetown is nearing completion and it is anticipated that it will be ready for the reception of patients in a few months' time. During the year the McGregor Convalescent Home has been enlarged and plans for additions to the Eaton convalescent Home were prepared and passed. Two new hospitals, one at De Aar and one at Alice, were completed and formally opened. The former provides accommodation for about 40 patients, while the latter has accommodation for 8 European Patients. The schemes for enlarging and modernizing the hospitals in Kimberley, Queenstown, Port Elizabeth and Uitenhage have made satisfactory progress. Plans for extensions to the hospitals in Malmesbury, Riversdale, Oudtshoorn, Kingwilliamstown, Matatiele, Cathcart, Upington and Mafeking were prepared and submitted to the Department for examination and report. The scheme for providing improved accommodation for

patients in Vryburg appears to have made no further progress and the unsatisfactory arrangements in that centre still continue. Plans for very entensive additions to the Butterworth Hospital were submitted to the Department for inspection, but had to be referred back for reconsideration of the entire scheme. Plans for a hospital at Somerset West were prepared and submitted by the Stellenbosch Hospital Board for examination and report.

In the Orange Free State plans for additions to the hospitals in Harrismith, Bethlehem, Clocolan and Ficksburg were examined and reported on by the Department. The scheme for providing a new maternity section in the grounds of the National Hospital in Bloemfontein is making satisfactory progress.

In the Transvaal Province schemes for the erection of new hospitals in Klerksdorp and Middelburg have been prepared but building operations have not yet commenced. At Piet Retief a small hospital is in course of erection while building operations on the Potgietersrust Hospital have been delayed owing to the difficulty experienced in selecting a suitable site. Extensions to the hospitals at Rustenburg, Pietersburg, Lydenburg, Sabie, Barberton and Standerton are at present under consideration. Extensive additions to the General Hospital in Johannesburg are at present being carried out. During the year a commission was appointed by the Provincial Administration to inquire into the hospital position of the Province generally and the working of the Public Hospitals Ordinance. The commission has completed its investigations and has submitted a useful report.

Chronic Sick Hospitals.—The construction of the new chronic sick hospital on the Cape Flats is making satisfactory progress. When completed this institution will provide accommodation for about 630 patients. Plans for extensions to the chronic sick hospital at Grahamstown have also been prepared and passed.

In the Transvaal the new chronic sick hospital at Rietfontein is being erected and it is anticipated that the buildings will be ready for occupation before long. When completed this institution will have accommodation for about 370 patients.

Up to the present no chronic sick hospital has been provided in the Orange Free State Province, though a few beds for chronic sick European patients are available in the Bloemfontein Municipal Isolation Hospital at Tempe. The need for accommodation for incurable cases in the Province is a very real one, and it is understood that the question as to the most suitable scheme has already been investigated by the Provincial Administration. It is, however, not known whether any decision on the subject has been arrived at.

The chronic sick hospital for Natal, situated at Hillcrest, near Durban, provides accommodation for approximately 100 patients.

12. *Medical, Dental and Pharmacy Act, No.* 13 *of* 1928.—A. *Habit-forming Drugs.*—The Department continues to administer the Act in regard to dagga, opium and other habit-forming drugs. The enforcement of the regulations is carried out in co-operation with the Police, Commissioner of Customs and Excise and the Postmaster-General.

The following table shows the prosecutions and convictions:—

TABLE R.—PROSECUTIONS AND CONVICTIONS UNDER LAWS RELATING TO HABIT-FORMING DRUGS DURING THE PERIOD 1ST JULY, 1936, TO 30TH JUNE, 1937.

Province.	European.		Native.		Asiatic.		Other Coloured.		Total.	
	Prosecutions.	Convictions.	Prosecutions.	Convictions.	Prosecutions.	Convictions.	Prosecutions.	Convictions.	Prosecutions.	Convictions.
Cape.....	61	51	652	589	9	9	1,162	1,113	1,884	1,762
Natal.....	15	13	2,186	2,133	74	70	116	101	2,391	2,317
Transvaal.....	54	50	2,442	2,340	9	7	200	183	2,705	2,580
O.F.S.....	14	12	246	236	—	—	27	27	287	275
UNION.....	144	126	5,526	5,298	92	86	1,505	1,424	7,267	6,934

The total number of prosecutions in the Union amounted to 7,267 of which 7,259 were in respect of dagga and 8 on account of other habit-forming drugs. Considerable quantities of dagga and $2\frac{3}{4}$ lb. of opium were seized and confiscated.

The quantities of habit-forming drugs imported into the Union during the year ended the 30th June, 1937, were:—

Raw opium, 569 lb. 6,562 grs.; medicinal opium, 167 lb. 1,400 grs.; opium in the form of extracts and tinctures, 58 lb. 5,057 grs.; coca leaves, 50 lb.; Indian hemp in the form of extracts, 122 lb.; morphine, 55 lb. 937 grs.; heroin, 19 lb. 3,772 grs. and cocaine, 59 lb. 4,664 grs.

The following habit-forming drugs were exported from the Union to the adjoining territories during the period under review:—

Medicinal opium, 22 lb. 6,027 grs.; *Cannabis indica*, 6,125 grs.; morphine, 4,595 grs.; heroin, 208 grs. and cocaine, 1 lb. 5,698 grs.

In addition to the above quantities of drugs exported, 1,000 lb. of *Cannabis indica* were exported to Great Britain by a specially licensed producer.

The amended regulations regarding the importation, sale and use of opium and other habit-forming drugs, will come into force before the end of the year 1937. The form of register which must be maintained by medical practitioners, dentists, chemists and druggists and authorised veterinarians in terms of section 65 of Act No. 13 of 1928, has been prescribed in the regulations, and registers are obtainable from the South African Pharmacy Board. As the register has been drafted to meet the requirements of all persons concerned, the Department will take such action as is considered necessary in the event of any person failing to maintain such registers in accordance with the requirements of the Act.

The import and export certificate system to regulate the distribution of narcotic drugs as laid down in the Geneva Convention, 1928, and Limitation Convention, 1931, appears to be working satisfactorily, and few difficulties have arisen in regard to the Government's obligations under the two Conventions.

Illicit traffic in narcotic drugs is practically non-existent in the Union and as the legislative measures laid down in Act No. 13 of 1928 with the regulations made thereunder are considered adequate to keep the trade within proper limits, it was decided that the Union Government should not become a party at the present time, to the Convention of 1936 for the Suppression of the Illicit Traffic in Dangerous Drugs.

There are comparatively few persons in the Union addicted to the use of the so-called " white drugs ", but the Department has been requested to furnish information to the Secretary-General of the League of Nations relating to the extent of addiction, establishments for the treatment of addicts and the number of addicts belonging to certain professions, as the campaign against the illicit traffic in narcotic drugs and drug addiction itself was hampered by insufficient knowledge as to the extent of the last-named problem.

Addiction to the use of *Cannabis* (dagga smoking) is very rife amongst the Native communities and it would be a big undertaking to examine the whole position in order to ascertain the magnitude of the problem, with any degree of accuracy, with which the Department has to deal.

B. *Poisons.*—Sections 50 and 51 of Act No. 13 of 1928, relating to poisons, were amended by the Medical, Dental and Pharmacy Amendment Act, No. 5 of 1937, which came into operation during the course of the year. The amendments contained therein will necessitate certain further amendments to the regulations which will do much to clear up anomalies which have arisen in the administration thereof.

The indiscriminate issue of certificates to general dealers in terms of section 51 of Act No. 13 of 1928, for the sale of poisons appears to have stopped and only such certificates have been issued, in the magistrate's discretion, according to the requirements of the districts and where the continuation of such certificates is in the public interest.

Preparations containing poison are still being sold, which are not labelled in accordance with the requirements of the Act and regulations, but the manufacturers or distributors, after advice or warning by the Department, have in most cases rectified the matters brought to their notice.

The attention of numerous wholesale dealers have been directed to the provisions of No. 6 (2) of the regulations published under Government Notice No. 1662 of 15th November, 1935, whereby it is an offence to supply poisons or " patent ", " proprietary " or " Dutch " medicines containing poison to a general dealer for resale, unless furnished with the date and number of the certificate authorising such retail dealer to keep for sale and sell such poisons or preparations containing poison. Generally it has been found sufficient to warn the wholesaler concerned, without taking further action in the matter.

As a result of recent press references the drug " Benzedrine " *B. phenylisopropylamine* has come into undeserved prominence. It is a

new drug the properties of which are apparently not yet thoroughly understood and there are many possible dangers arising from its use, if administered except under the supervision of a medical practitioner. On account of the uncertainty regarding the dangers which may arise from the use of this drug, it is felt that its sale should be subject to some form of control, and the South African Medical Council and the South African Pharmacy Board have been approached for their views in the matter.

C. *General.*—The Department's inspectors, in conjunction with their duties under the Food, Drugs and Disinfectants Act, No. 13 of 1929, have inspected the poison registers which general dealers, having authority to sell poisons, are required to keep in terms of Act No. 13 of 1928, as also the stocks of habit-forming drugs and registers maintained by chemists and druggists in terms of the same Act. Infringements continue to be revealed which necessitate the issue of written warnings. Although not of such frequent occurrence, instances still come to light of the sale of "patent", "proprietary" or "Dutch" medicines containing poison by general dealers within the five-mile radius of a town or village wherein a chemist and druggist is carrying on business. Warnings have been issued and in several cases prosecutions have been resorted to where infringements have continued after due warnings have been given.

13. *Proprietary Medicines and Appliances.*—Legislation to protect the public in South Africa from fraudulent trading in patent medicines is long overdue. A Bill to this end has been presented to Parliament and was referred to a Select Committee. In his evidence before the Select Committee on the subject of the Bill the Chief Health Officer stated that in most countries in the world to-day the need for such control was recognised by almost every responsible person. In some countries, however, notably in Great Britain, the trade has been so well organised that it has been enabled to resist attempts made by successive Governments to bring into effect legislation.

In South Africa the Government has special responsibilities for the large non-European populations, which are apt to regard as true everything that is told to them by Europeans whether by word of mouth or in print. For the sake of the non-European population, in particular, it is considered that effective legislation is necessary.

For many years past members of the general public, of the Police and of various public bodies, have from time to time furnished the Union Health Department with samples of proprietary medicines or with literature which accompanied samples which they had acquired. In some cases an opinion on the value of the medicine was requested; in others complaints were made that the proprietary product did not produce the results claimed; and in some cases the literature accompanying the medicine was forwarded on account of its indecent or suggestive nature.

It had, of course, long been known that South Africa was a particularly happy hunting ground for the purveyors of proprietary medicines. A considerable number of these medicines was known by the Department to be first-rate home remedies if given for certain conditions; some were harmless, but could not possibly carry out the claims made for them and a few were definitely harmful to a greater or lesser extent.

A glance at the advertisement columns of most of the newspapers or periodicals sold in the Union, until some years ago, showed that a remittance to specified addresses would produce certain cures for almost any disease varying from haemorrhoids to blindness.

One can well understand that in any country of great distances and sparse population where medical aid is difficult of access there is a desire to have household remedies handy and in the early days the bulk of the population was ready to believe almost anything that was speciously described, particularly if no obviously harmful results followed its use. Further, in the Native Territories in particular, advertisements were circulated for medicines claiming to have virtue as love philtres or to cure sterility or to strengthen sexual power or to cure venereal disease.

Some of the claims made on behalf of these remedies were so harmful that the Government of the day found it necessary in 1919 to introduce a special section 65 into the Public Health Act, which reads as follows:—

> "65. (1) No person shall publish any advertisement or statement intended to promote the sale of any medicine, appliance or article for the alleviation or cure of any venereal disease or disease affecting the generative organs or functions or of sexual impotence, or of any complaint or infirmity arising from or relating to sexual intercourse.
>
> (2) Any person who publishes any such advertisement or statement by printing it in any newspaper or exhibiting it to public view in any place or delivering or offering or exhibiting it to any person in any street or public place or in any public conveyance, or

who sells, offers or shows it or sends it by post to any person, shall be guilty of an offence. For the purpose of this section ' advertisement ' or ' statement ' includes any paper, document or book containing any such advertisement or statement.

(3) This section shall not apply to publications by the Department of Public Health or by any local authority, public hospital, or other public body in the discharge of its lawful duties, or by any society or person acting with the authority of the Minister first obtained, or to any books, documents or papers published in good faith for the advancement of medical science."

This effected a substantial improvement in many of the advertisements and the threat of legal proceedings being taken under the section, induced a good many objectionable advertisements to be withdrawn or modified.

The position while bettered in certain respects was, however, still thoroughly unsatisfactory, repeated instances coming to the notice of the Department of advertisements which were objectionable, fraudulent or definitely untrue.

In 1935 the Minister of Public Health decided to appoint a Committee to inquire into the question of the desirability of amending the laws with a view to the more effective prevention or restriction of the publication of false, misleading or fraudulent advertisements or statements, intended to promote the sale of medicines and medical preparations and appliances. The Union Health Department had found that the existing law was most unsatisfactory in that no powers were available whereby any control could be exercised over the sale and advertisement of obviously fraudulent and dangerous nostrums.

The Food and Drugs Act of 1929 whilst enabling a control to be exercised over the purity and sale of foodstuffs was quite inadequate when applied to proprietary medicines and in fact exempted the seller of proprietary medicines from disclosing the names of ingredients and the proportion of these ingredients.

The Acts existing in the Union which dealt with the various aspects of the control of the sale and advertisement of drugs were discussed in the Report of the Committee of Inquiry and summarised as follows:—

" The Committee has no hesitation in stating that in its opinion the existing legislation, whatever its objects and provisions in so far as it relates to proprietary medicines, etc., for human consumption, is ineffective to deal with the problem of adequate control of advertisements and distribution of undesirable proprietary medical preparations."

In contrast with the existing laws dealing with the control of proprietary medicines intended for human consumption are the regulations Nos. 2130 of 1924 made under Act No. 21 of 1917 which enable control to be exercised over stock remedies intended for the treatment of various animal diseases.

Thus in South Africa animals are protected against the use of fraudulent remedies whereas the human population of the Union is at the mercy of any individual who, after paying the revenue licence fee, sets out to fleece an unprotected and gullible public.

It must not be imagined that all proprietary medicines are dangerous or that the manufacturers of all these medicines make extravagant or pernicious claims in their advertisements. Many of the better known proprietary medicines are sold with a full disclosure of the formulae. These and many others are advertised with claims to which exception need not be taken.

On the other hand, as the Committee of Inquiry noted, many proprietary medicines are sold in the Union, for which most extravagant claims are made. The majority of these medicines are sold to the lower social strata of the European population, to Asiatics and to Natives, but one finds them also in the homes of the well-to-do.

A survey of the daily newspapers and periodicals sold in the Union has shown that by far the greater number of pernicious advertisements are found in some of the Afrikaans periodicals. Perhaps this is because the people in the Platteland are more ready to believe what they find printed in their own papers than the people in the towns. It is interesting to note that whereas, after the publication of the Report of the Committee of Inquiry, many of the English periodicals refused to accept advertisements dealing with diseases scheduled in the Committee's report, no such restraint has been observed in the advertisements found to-day in some of the Afrikaans periodicals.

The Newspaper Press Union has maintained for some years past a censoring committee which reviews at intervals, advertisements of proprietary

medicines destined for the journals controlled by its members. Unfortunately, a number of newspapers and periodicals sold in the Union is not controlled by the Newspaper Press Union and although the censoring committee undoubtedly exercises some beneficial effect, it still seems to pass any number of unsatisfactory advertisements. Thus even to-day the advertising of proprietary medicines, both in the English and Afrikaans Press in the Union, frequently shows most extravagant and fraudulent claims which tempt the more credulous sections of our population.

It has become increasingly obvious, particularly since the publication of the Report of the Committee of Inquiry that legislation is urgently needed to control the proprietary medicines trade in the Union. That there should be little difficulty in the administration of an Act such as that which was this year introduced into the House of Assembly, is shown by the ease and efficiency with which patent medicine vendors are controlled in Canada. In view of the satisfactory record of administration of the Canadian Act and of the Stock Medicines Regulations of the Union, the proposed legislation to control the advertisement, manufacture and sale of proprietary articles in the Union has been designed to embody the best features of both these legislative measures.

The Committee of Inquiry noted in its report the increasing number of " quack " practitioners of medicine pracitising in the Union and considered that a control of proprietary medicines and appliances, unless accompanied by some restriction over the activities of these pseudo-medical practioners, would be most unsatisfactory. Accordingly provisions have been made in the Bill for the control of advertising by these individuals.

More recently it has come to notice that manufacturers of powerful electrical machines, including x-ray machines, are being asked to supply these machines to unqualified persons. The inclusion of a clause making it illegal for any such person other than a medical practitioner or dentist to own or operate such machines unless licensed by a competent authority was strongly advocated.

In some of the proprietary medicines sold in the past the composition has varied to an enormous extent. This has usually been due to the fact that there has been no skilled supervision exercised in their manufacture. Clause 23 of the Bill keeps the position in line with sub-section (1) of section 37 of the Medical, Dental and Pharmacy Act, 1928, as amended by section 2 of the Medical, Dental and Pharmacy Amendment Act, 1937, with the further requirement that the name of the person responsible must be furnished to the Registrar.

Some proprietary medicines are being to-day manufactured on unsatisfactory premises. The registration of such medicines will enable some supervision to be exercised over the premises under the ordinary machinery of the Public Health Act.

There is little doubt that legislation of the type projected is urgently required in the Union. The honest manufacturers of proprietary medicines, and these are in the majority, should have little to fear from such legislation while the control of fraudulent vendors of nostrums on the lines successfully instituted in Canada, Australia, United States of America, Germany, France, Switzerland and Italy should go far to rid the population of a type of parasite which has for long battened on the health and earnings of the poorer sections of our population.

The Department had exactly the same experience in its control over the sale of food. Prior to the promulgation of the Food, Drugs and Disinfectants Act, wholesale fraud was perpetrated on the public by dishonest traders. The Act has gradually eliminated adulteration of foodstuffs and it is believed that if the Bill which received the endorsement of the Select Committee with some amendment becomes law, a great step forward will be achieved in preventing fraud and in abolishing the use of drugs which may be dangerous if not prescribed by a medical practitioner.

Duke-Fingard Treatment.—The necessity for protecting the general public from exploitation was illustrated very clearly by the publicity recently given in the lay press to the Duke-Fingard treatment for tuberculosis and other pulmonary ailments.

In this treatment the patient is placed in a room, the air temperature of which is kept at between 70° and 80° F. An electric fan draws fresh air from the outside first through a drying calcium chamber, thereafter it is heated by an electric heater, passed over a series of trays of chemicals and so into the patient's room. The chemicals are described as consisting of phenol in combination with a mixture of the essential oils, aromatic substances, iodine, creosote and other coal tar derivatives. The room is as nearly as possible hermetically sealed to prevent escape of the medication, and to prevent the humidity rising above 40 per cent. and the temperature below 70° F. The patient spends increasingly long periods in this sealed chamber commencing with about three hours per day until sixteen hours daily is reached.

Though the patients at first may complain of irritation of the eyes, nose and throat passages, it is claimed that these symptoms rapidly pass off as they become accustomed to the medication. A doctor who reported to the British Medical Journal on a patient of his who was undergoing this treatment at his home, stated that he visited the house some two or three weeks after treatment had begun and found the odour of the vapour unpleasant-smelling, but not irritating, though it was capable of removing the finish from all furniture and woodwork with which it came into contact. Two months after treatment was commenced the doctor was called in to see the patient who had contracted acute bronchitis; he died three days later. The doctor was of opinion that from his previous experience of the patient he would in the ordinary course of events have lived another fifteen years.

Mr. Fingard himself visited South Africa during the year. He interviewed a number of medical men, proprietors of nursing homes and financiers with a view to the introduction of his method of treating respiratory diseases He admitted to officers of this Department that in the case of well-to-do people he regarded an assessment of one-tenth of the patient's annual income as a reasonable fee for his treatment. One patient in Capetown is reported to have paid a thousand guineas for the treatment.

Owing to the publicity that the Duke-Fingard method was receiving in South Africa and the possibility that many ailing members of the public might be induced to undergo this very expensive method of treatment, it was considered desirable to investigate it somewhat closely. Dr. B. Dormer, Medical Superintendent of the Nelspoort Sanatorium, who was in Europe on study leave was, therefore, instructed to ascertain to what extent, if any, the treatment was being adopted by tuberculosis experts in the United Kingdom.

In his report Dr. Dormer pointed out, as Dr. Allan had already previously done, that the inhalation of vaporized chemicals, which is the main feature of the Duke-Fingard method, has long been a recognised form of treatment for chronic chest conditions; for obvious pathological reasons it is impossible to heal an avascular structure such as a tubercle, by means of inhaled vapour; inhalation methods, of which there are many including that of Mr. Fingard, may be of definite value in such conditions as asthma, bronchiectasis, sinusitis and the secondary infections which may be superimposed on pulmonary tuberculosis.

Several leading experts on tuberculosis in Great Britain informed Dr. Dormer that after full consideration they were unable to advise their local authorities to adopt the Fingard treatment. In fact, Dr. Dormer found that it was the general opinion in Great Britain that inhalation therapy by means of the Fingard apparatus could in no sense be a cure for pulmonary disease, though it might have some value as an ancillary form of treatment. He considers the method an unnecessarily expensive one and that other similar methods of the same therapeutic value were available at a much smaller cost.

" Hay " Diet.—There seems to be a vogue in South Africa at present for the so-called " Hay " diet founded by William Howard Hay, whose activities in capitalising food fads and fantasies were recently exposed by the American Medical Association.

The thesis developed by Dr. Hay, which has apparently been accepted by thousands of persons possessing a dangerously small knowledge of chemistry and physiology, seems to be that all pathological states are due to errors in diet and " deficient drainage ". To overcome this clogging of the drainage apparatus he advises the use of " Pluto water " and then a change in the dietary habits of the patient. The magic word " acidosis " is his trump card and he postulates a definite " connection between acid-forming foods and disease ". Thus he states " Food is a direct cause of disease because it is the only source through which we can create these acids. If acid causes disease, as there is not the slightest doubt, and if acid can come from nothing but food, then food is the one and only cause of disease, and how can we escape such conclusion ".

Dr. Hay has no doubt as to the causes of acidosis. He enumerates them as: (1) The use of too much concentrated protein; (2) the use of " refined, processed, denatured, emasculated, bleached, preserved, adulterated " foods, chiefly of the carbohydrate group; (3) the combining of proteins and carbohydrates; and (4) the retention in the colon of food residues beyond twenty-four hours following their ingestion. Nearly every food faddist develops the obsession that proteins and carbohydrates should not be eaten at the same time, because, forsooth, proteins need acid for their digestion, while carbohydrates call for alkaline digestive juices. The human stomach is apparently conceived as a large, open bag into which food drops, or is passed down, through the oesophagus. When it is remembered that most natural foods contain both protein and carbohydrate and that primitive man had no means of separating them, the exponents of this theory must find considerable difficulty in accounting for man's rise to his present biologic level. He could hardly have done this if he was for thousands of years being systematically poisoned by " acidosis ". But here the " Hay " dietists are victimized by their dangerously small knowledge.

In the dedication of his book " A New Health Era ", he quotes Benjamin Franklin's dictum that " but one per cent. of humanity is capable of independent thought and correct reasoning "; and he would have us believe that his tremendous popular success has been achieved by appealing to this one per cent. This does not seem to look quite right statistically. He is very much aware of the exploitation value of " superstition and fear ". Fear, he says, " has been the means of exploitation always, and still is to-day ". Again, " we exploit those who do not know as much as we think we know "; and, " this superstitious attitude that has always handicapped the ill has lent this class to continual exploitation ". But, of course, it is the practitioners of " orthodox medicine " and not " original thinkers " like himself who have done the exploitation!

He is on sound ground when he urges, as he is continually doing, the greater consumption of fruit and vegetables. These provide the bulk, or roughage, of which so many of the more opulent middle-aged are in sore need. To this and the great power of suggestion his success must be attributed. But he would hardly have collected his tremendous public had he been content with so simple and obvious an explanation. Hence the necessity for the introduction of the pseudo-scientific nonsense about " acid-forming " and " alkaline-forming " foods.

It is not surprising to learn that Dr. Hay is an anti-vaccinationist since he holds that smallpox is nothing but " an effort to throw off waste matter ".

The institutions, where the peculiar ideas that Dr. Hay holds are being turned to commercial account, are rapidly increasing. One need not be much concerned about them if they were merely catering for persons who would be food faddists in any case. Such persons find benefit from any disciplined system because of the power of suggestion. But when Dr. Hay sets out to cure real disease the matter becomes more serious. He claims, for instance, to cure diabetes without insulin. One patient who adhered to Dr. Hay's " alkaline " diet rigorously for several months without recourse to insulin was only saved from death by coming under medical treatment at the last moment. On examination he was found to be in an advanced state of acidosis. He was at once put back on insulin (which he had been receiving before falling a victim to the Hay propaganda), and after being in a very critical condition for three weeks was brought back to his normal health. The patient in a letter to Dr. Hay stated: " I would be false to myself if I failed to give expression to my own sad experience and by remaining silent permit other unfortunates to jeopardize their health or probably life itself, and deem it my duty to humanity to bring these facts to the attention of the American Medical Association. It may be that you really believe in what you pretend to be able to do, but with the facts as herein stated, I do not see how you can continue without doing violence to your conscience."

When after reading the views of the American Medical Association one contemplates the apparently rapidly increasing number of Dr. Hay's followers, one can only marvel at the wonders of modern advertising and man's bottomless credulity.

14. *Adulteration or False Description of Food, Drugs and Other Articles.* —The following table reflects the administrative measures taken during the year under the Food, Drugs and Disinfectants Act, No. 13 of 1929:—

TABLE S.—SAMPLES TAKEN FOR EXAMINATION OR ANALYSIS UNDER ACT NO. 13 OF 1929, DURING THE YEAR ENDED 30TH JUNE, 1937, AND THE RESULTS.

Place.	Total Taken.	No. Analysed or Examined.	No. found Adulterated or Incorrectly or Falsely Described.	Prosecutions.	Convictions.	Remarks.
Ports of Union.....	212	207	69	—	—	Warnings *re* labelling and standards were issued in respect of 22 samples; 107 were detained pending re-labelling; 4 were destroyed.
Cape Province.....	1,997	1,981	292	112	96	—
Natal Province.....	698	696	39	30	20	—
Transvaal Province..	2,246	2,238	340	286	256	—
Orange Free State Province.....	406	405	39	40	34	—
TOTAL.....	5,559	5,527	779	468	406	

A comparison of the foregoing figures with those for the 12 months ended 30th June, 1936, discloses that *595* more samples were taken during the year under review than during the first-mentioned period, whilst *267* more

samples were found on analysis to be adulterated or falsely described, *131* more prosecutions instituted in respect of adulteration or false description and *121* more convictions obtained.

Imported Articles dealt with at Union Ports (including Inland Customs Ports of Entry).—The work in this connection is still being carried out with the co-operation and assistance of the Department of Customs and Excise and of the 212 samples submitted for analysis or examination 63 came from Capetown, 63 from Johannesburg, 55 from Durban, 20 from Port Elizabeth, 9 from East London and 1 each from Pretoria and Bloemfontein. Of these, 47 were found to be not up to standard, 22 warnings were issued on account of defective labelling or deficiency in standard, 107 consignments were released after relabelling in Customs, 4 were destroyed and 8 reshipped. The articles examined included cheese (72 samples), ghee (36 samples), disinfectants and drugs (14 samples each), fish (10 samples), milkpowder and fresh canned peas (9 samples each), meats (6 amples), flour and processed canned peas (5 samples each), malt extract (4 samples), fruit juices, ice-cream powder, marmalade and condensed milk (3 samples each), cream, pickles, preservatives and canned mixed vegetables (2 samples each) and cocoa-paste, custard powder, fats, canned fruit, fruit drink powder, leavening substance, margarine and canned soup (1 sample each).

Sampling by Local Authorities.—No fresh delegations under section 2 (3) of the Act were made during the year and the number of municipalities authorised to carry out the sampling in their areas of perishable articles as also flour, meal, bread and other articles not packed or sold in sealed packages remains the same, viz., 29. They are:—Capetown, East London, Graaff-Reinet, Grahamstown, Kimberley, Kingwilliamstown, Paarl, Port Elizabeth, Queenstown, Uitenhage and Walmer (Cape Province); Benoni, Boksburg, Brakpan, Germiston, Hercules, Johannesburg, Krugersdorp, Nigel, Potchefstroom, Pretoria, Randfontein, Roodepoort-Maraisburg, Springs and Vereeniging (Transvaal); Bloemfontein and Kroonstad (Orange Free State); and Durban and Pietermaritzburg (Natal). These local authorities are entitled to the examination or analysis in a Government laboratory, free of charge, of an annual number of samples calculated on the basis of four samples per thousand of their European population. During the year a total of 2,903 samples was taken by them under their delegated powers (namely, 783 in the Cape Province, 1,652 in the Transvaal, 370 in Natal and 98 in the Orange Free State) of which 463 were found to be adulterated. Legal proceedings were instituted in 341 cases. Convictions were obtained in 308 of these cases and fines totalling £1,235. 10s. were imposed. The more important articles submitted for analysis included 2,324 samples of milk (315 adulterated), 315 meat and fish (74 adulterated), 90 sausages (29 adulterated), 96 ice-cream (30 adulterated), 65 coffee and chicory (7 adulerated), 22 flour and meal (none adulterated), 12 fats and oils (none adulterated), 9 cheese (2 adulterated), 13 honey (1 adulterated), 14 bread (none adulterated), 8 pepper (none adulterated), 5 dried fruit (1 adulterated), 6 sugar (none adulterated), 3 dried milk (1 adulterated), 9 butter (2 adulterated), 6 rice (1 adulterated), 3 sweets (none adulterated), 2 oats (none adulterated), 2 tea (none aulterated) and 1 each of mineral water, cinnamon, condensed milk, cream and curry (none adulterated).

Sampling by the Department.—The Department's inspectors, two of whom are stationed in Capetown, one in Pretoria and one in Durban, are entrusted with the duty of carrying out sampling in the areas allotted to them for inspection purposes under the Act. In smaller urban areas sampling, especially of milk, takes place with the co-operation and assistance of the South African Police. In Johannesburg the City Council's inspectors carry out, on behalf of the Department, the sampling of milk on Railway premises and of such articles as are not covered by the powers delegated to the Council in terms of section 2 (3) of the Act. A total of 2,444 samples were submitted for analysis, of which 247 were adulterated. A hundred and twenty-seven prosecutions were instituted and 98 convictions recorded, in respect of which fines totalling £203 were imposed. Some of the articles analysed included milk, 1,923 samples (154 adulterated); drugs and medicines, 123 (22 adulterated); meat and fish, 87 (24 adulterated); fresh fruit, 54 (5 adulterated); aerated waters and squashes, 40 (2 adulterated); coffee, 31 (2 adulterated); ice-cream, 23 (9 adulterated); dried fruit, 21 (10 adulterated); fats and oils, 19 (none adulterated); chutneys and sauces, 12 (1 adulterated); soap, 11 (1 below standard); disinfectants, 10 (3 adulterated); pepper, 9 (none adulterated); cheese, 8 (all adulterated); baking powder, 8 (1 adulterated); canned vegetables, 7 (none adulterated); honey, 7 (none adulterated); jams, 6 (none adulterated); liquid paraffin, 4 (2 adulterated); custard powder, 3 (none adulterated); peanut butter, 3 (none adulterated); ginger, 3 (2 adulterated); jelly, 3 (none adulterated); bread, 3 (none adulterated); curry, 2 (none adulterated); flour, 1 (not adulterated); cream, 1 (adulterated); and 19 articles under the heading miscellaneous (all in order).

Milk Standards.—Some years ago representations were made to the Department regarding the standard required for solids-not-fat in milk. It

was suggested that the standard laid down, 8·5 per cent., was too high. But it was considered inadvisable to lower this standard before the matter had been fully inquired into by the Department of Agriculture which was invited in 1931 to institute the necessary investigations. To allow time for these investigations, and also to permit of dairy farmers being educated in the direction of eliminating from their herds cows yielding poor milk and otherwise improving their stock, this Department agreed to some relaxation of the regulations. It undertook not to prosecute during a period of five years, if the non-fatty solids in samples of milk did not fall below 8 per cent., unless there was clear evidence of adulteration.

The period of grace has now lapsed; but as the Department of Agriculture is not yet in a position to make a statement on the matter the period is being temporarily extended. Certain technical officers of that Department who are at present overseas are studying the question there, and it is hoped that on their return it will be possible to reach finality.

" Improvers " in Flour.—Requests for permission to use " improvers " in flour have once more been made, both to this Department and the Department of Agriculture. The agitation for the withdrawal of the prohibition has come from Cape millers. They point out that the importation of high quality Canadian wheat has virtually ceased because of tariffs. A considerable portion of South African wheat on the other hand is of poor quality which does not produce flour capable of making good bread without the admixture of high quality flour or of " improvers ".

The Stellenbosch-Elsenburg College of Agriculture conducted special investigations into the matter. The experts there emphasized the importance, should " improvers " be allowed, of permitting only the use of apparatus capable of supplying the correct amount of " improver " to the flour stream, and then only in mills where technically trained millers were in charge. The toxicological chemists of the Division of Chemical Services reported also on the question of the extent that health might be endangered by the use of these substances. If chemicals are to be permitted they considered that these must be of such a nature as to obviate all possibility of injurious compounds being formed. Such results would, for instance, occur if potassium bromate were used.

In view of these inquiries this Department would appear to be justified in refusing to allow the use of " improvers ". Moreover, if they were permitted their use would be difficult to control and the inducement to local farmers to improve their wheat would be lacking. The Department is definitely of opinion that under existing circumstances it would be inadvisable to recommend the amendment of the law in the direction asked for.

The failure of some millers to provide their mills in which grain is milled for human consumption with efficient sieving and winnowing appliances so as to remove completely any poisonous or unwholesome seeds or matter, has again come to the Department's notice and its inspectors have been specially instructed to visit such mills in conjunction with their inspection tours under Act No. 13 of 1929 with a view to ensuring that the law's requirements in this regard are duly observed. To the same end the co-operation of local authorities with delegated powers has been sought. In view of cases of belladonna and senecio poisoning having been traced to this source, the necessity to comply with the provisions of Regulation 12 (7) cannot be too strongly stressed.

Two further amendments to the Food and Drugs Regulations have been gazetted. They are in respect of:—

(*a*) *Edible Oils.*—In order to deal effectively with inferior oils on the South African market and ensure the production of a wholesome article, it was found necessary to frame a new Regulation [No. 14 (10)].

(*b*) *Cheese.*—As the result of some farmers marketing certain products known as " cottage cheese " and " creamed cottage cheese " which are made from skimmed milk and contain very little milk-fat, but which in fact are extremely nutritious and delicious articles of food, it was felt that something should be done to encourage in this country the sale of these products which in other parts of the world enjoy enormous popularity. The matter was thoroughly considered in consultation with the Division of Dairying and in consequence it was decided to substitute the existing Regulation No. 10 by a new one which, while safeguarding the purchaser by requiring the article to be labelled " Skim-milk Cheese ", permits the sale of cheese made solely from skim-milk and containing practically no, or very little, milk-fat.

The reprint, in pamphlet form, of the Food and Drugs Regulations (including all the various amendments) which was forshadowed in last year's report, has been completed and this handy booklet—form 531 (Health)—is obtainable from the Government Printer at the price of 6d.

General Warranties.—One new warranty under section 28 of the Act was registered and one was allowed to lapse.

General.—The Department's inspectors continue to carry out inspection tours of the Union in connection with the enforcement of the provisions of Act No. 13 of 1929, and these still reveal irregularities which necessitate written warnings being sent to the offenders. On the whole, however, a decided improvement is noticeable on the part of manufacturers and others in complying with the labelling requirements of the Act.

15. *Unsound Foodstuffs.*—Although it was impossible to stop every consignment of foodstuffs entering the country, the inspection and examination of such articles continued as far as was practicable with the collaboration of the Department of Census and Excise, and those condemned as unfit for human consumption included 350 cases of condensed milk; over 400 tins of beef and meat; 56 cases of canned fish, salmon and sardines; 20 cases of almonds; 12 cases of green peas; 5 cases of dried fruit and figs; 7 bags of nutmegs; 8 cases of dates; 30 sides of bacon; 110 bottles of pickles and peas; 174 tins of rabbit; 32 tins of parsnip; 6 barrels of herrings; 2 cases of vegetable fat; 6 cases of anchovies in brine; 2 bags of flour; 2 bags of wheat; 2 bales of wineblocks; 1 bale of cinnamon; 1 case of coffee samples; 1 case of sausages and hams; 1 bag of tamarinds; 1 bag of rice sweepings and 1 bag of seeds.

The total approximate value of foods destroyed in terms of the Port Health Regulations as unfit amounted to £469. 4s. 11d.

Inspectors of the Department in the course of their inspection tours under Acts No. 13 of 1928 and No. 13 of 1929 also dealt with tinned foodstuffs stocked by general dealers, and such as were found to be blown or otherwise not sound were suitably disposed of.

In places where there is a constituted local authority, action under the Unsound Foodstuffs Regulations of course devolves on such authority.

16. *Food Production and Malnutrition.*—Attention has frequently been drawn by this Departmnet and other observers to the under-nourished condition of large sections of the population of the Union. This propaganda has resulted in a valuable resolution by parliament to organise a nutrition survey among children. Detailed arrangements have been made for this survey which is to be conducted mainly by school health staffs—doctors and nurses. Arrangements have also been made for sample surveys in Native areas.

There has, of course, never been any doubt in the minds of medical observers that very extensive malnutrition exists amongst most of the Bantu population and a very large number of Europeans. This malnutrition may sometimes be the result directly of insufficiency of food, but more usually the deficiency has been qualitative rather than quantitative. There is lack of balance in the dietary. Cereal and other starch foods being in general much the cheapest to raise, there is almost inevitably an excess of these substances in the dietaries of the poorer classes at times to the complete exclusion of other substances. Cereal foods including the local mealie meal are not directly harmful to health. On the contrary when suitably balanced with other foods they are a very useful source of nourishment. But unless these other substances are included in the daily dietary ill-health and an increased mortality rate must occur in the population.

For these other substances the useful name of protective foods has recently been coined. These are the foods containing the elements necessary for growth and repair of the body and its tissues as opposed to the starches and other carbohydrates which can provide only for the production of muscular energy and heat. The most important protective foods are milk and its derivatives, eggs, meat, fresh vegetables and fresh fruit, as it is these foods which supply the human body with the necessary minerals, vitamins and good proteins. It is precisely these which are so largely lacking from the diet of that very large section of the population which has difficulty in making ends meet.

The signs of extensive malnutrition are everywhere evident. A large number of young men examined annually for recruitment to the Active Citizen Force shows clear evidence of undernourishment during childhood in various degrees of body deformities. These include such readily recognised conditions as subnormal growth and weight, poor musculature, poor condition of the skin and poor dental structure. Particularly in dental examinations is this evident. Protective foods are needed by the pregnant and nursing mother as well as by the infant and child if normal dental development is to occur. Failing an adequate supply of protective foods throughout these periods there is malformation showing itself in early dental decay. Dental defect is, however, not the only stigma of defective feeding in childhood which is borne throughout life.

Malnutrition shows itself in many other ways. Outbreaks of scurvy and pellagra in Native territories betray gross vitaminic deficiency in the diet.

But less complete absence of protective substances in the food eaten also shows itself on every hand for those who wish to look for it. Insufficient protective substances in the diet lower the resistance to infection. Infections such as typhus and typhoid may be primarily spread by insanitation. Nevertheless they spread very slowly among the well-nourished. The alarming extent to which the Native populations and the indigent Europeans succumb to these maladies must be directly attributed to their malnourished state—malnutrition resulting not from insufficiency of food since mealie meal is generally very cheap, but from a gross insufficiency of protective foods.

Another disease, the alarming increase of which cannot be dissociated from food deficiencies, is tuberculosis. As in the case of the other infective conditions mentioned the morbidity and mortality figures must be treated with caution because of the usual association of contributory factors such as overwork, slums, overcrowding and insanitation generally. But every doctor who has made a special study of tuberculosis will be satisfied as to the influence of diet upon both the causation and the progress of the disease. Its effect has been demonstrated on a large scale in Europe in countries which suffered severe privations during and after the war. In those countries shortage of preventive foods coincided with a very marked recrudescence of tuberculosis mortality. Locally, too, this has been observed by mission hospitals. Financial stringency resulting from droughts and other causes has filled the wards of Bantu hospitals with sufferers from tuberculosis. That tuberculosis prevalence is much more directly the consequence of food deficiencies than of housing shortage and overcrowding was demonstrated by a striking observation in Denmark. In that country there had been a steady fall in the tubersulosis death-rate before the war. During the war it increased somewhat. This could be attributed directly to food restrictions as there was at that time no housing shortage. After the war when food supplies became normal the tuberculosis death-rate resumed its downward trend in spite of an acute housing shortage. Circumstances had provided a dissociation of the two main causes of tuberculosis mortality, inadequate nutrition and bad housing and had demonstrated the relatively much greater importance of the former.

The alarming hold that this disease is getting upon our Native population is dealt with in considerable detail elsewhere in this report. Here it will suffice to stress the importance of the food factor in this spread. The increasing hospital provision and considerable cost would certainly have been unnecessary had malnourishment of the populations concerned been avoided. A community is obviously badly organised which spends large sums of money on treating tuberculosis which could have been prevented had financial assistance made it possible for protective foods to have been provided to the people concerned.

Since it is evident that a serious degree of malnutrition with disastrous effects upon health exists among a large section of the Union population, it is necessary to consider in detail the measures that are available for combating this state of affairs. These measures consist of:—

(1) *Increasing the buying power of the impoverished section of the community.*—Since the protective foods are in general more expensive than the purely starchy foods, it is the latter which tend to be purchased at the expense of the former. The accessibility of such protective food can be made greater by the obvious method of increasing wages. It can also be done by assisting in their production or in their sale. It is the last measure which is found most satisfactory, viz., a subsidy at the retail end so that the consumer is directly benefited and the farmer indirectly. The object of State assistance should be to expand demand.

(2) *An agricultural policy which encourages the greater production of protective foods.*—Agricultural research should be directed along lines which are likely to result in vastly larger quantities of dairy produce, eggs, meat, vegetables and fruit being produced.

(3) *Education in dietetics particularly of doctors, teachers and all concerned with the preparation of foods.*—Lack of knowledge results in much money being wasted on foods of low protective value.

These measures warrant closer study. Increasing the food-buying power of the economically lower levels of the population is a measure at least as essential for the public health as direct campaigns against infectious diseases. The greatest single cause of defective nutrition in a community and its resulting ill-health is undoubtedly poverty. An improvement in nutrition has invariably been associated with an improvement of the general level of income. But even without changing the distribution or level of national income, improvement in the standard of nutrition is possible by better national organisation. An economic policy directed towards improved nutrition must reject all restrictions on the supply of foodstuffs to the people of the country. That in our present economic system the interests of the producer and middle-man receive far greater attention than those of the

consumer has been frequently pointed out. It is in regard to the protective foodstuffs that this system is particularly harmful to the public health. The amounts, for instance, of milk and dairy produce produced in this country at present are entirely inadequate to maintain a high level of health for the whole population. Yet during the year which ended last June, 8,727,303 lb. of butter were exported as merchandise from the Union. One has no hesitation in saying that these eight million pounds of butter were exported at the direct expense of the public health. Farmers should in the interest of the health of the Union population be encouraged to produce vastly greater quantities of milk and dairy produce *for disposal in the Union*. Any financial assistance given by the State should have the direct effect of making dairy products cheaper for those consumers belonging to the economically lower strata of the community. The same applies, though in somewhat lesser degree, to other protective foods such as eggs, vegetables, fruit and meat, including fish.

There are several ways in which the State can by direct action bring the supply of essential protective foods within the reach of the low-income and impoverished sections of the community. Further, much can be done to promote better market organisation and to bring producer and consumer closer together. It must again, however, be emphasized that the principal cause of general malnutrition among a population is poverty and the most effective public health measure is elimination of poverty. When direct public assistance is given it is, of course, essential that such assistance be guided by sound nutritional precepts, so that those foodstuffs are selected which will have the highest nutritional value.

The second group of measures for combating the admitted general malnutrition which exists among a large section of the European and most of the non-European population is concerned with agricultural policy. A widespread improvement in the nutrition of these classes will of necessity affect the demand for foodstuffs and, therefore, agricultural activity. A greatly increased demand for protective foods will have important reactions on our national agriculture. State assistance should take the form of encouraging the development of those branches of agriculture which produce the desired foods. Such assistance need not be directly financial. Scientific investigation into the best methods of producing suitable pasturage for dairy herds, for preventing disease in such herds, for the raising and feeding of the best kinds of poultry, the most suitable soils and fertilizers for fruit and vegetable culture—assistance of this kind, provided the ultimate products are destined for consumption in the Union, cannot fail to improve the nutrition and hence the health of the general population.

Lastly, much education in dietetics is still needed. This applies not only to the poorer classes who might often make much better use of their limited resources. It applies also to the wealthy who are able to supply their dietetic needs at random. Too often one finds among them ill-considered nutrition due to inadequate knowledge. Effective teaching and propaganda are likely to produce invaluable and rapid results. Such results have already been attained in other countries where during recent years dietary habits have been very considerably altered for the better. Training in correct dietary habits should form part of the education in all our schools, primary and secondary, and should not be confined to medical schools and schools of domestic science. In addition the health departments of local authorities should look upon propaganda of this nature as an essential part of their activities. The value of the wireless and the cinema in this connection should not be neglected.

Our medical schools need greatly to increase the amount of time allotted to nutrition. It should bulk much more largely in curricula and examinations. Many overseas universities have already advanced very rapidly in this direction. In these, students are trained in the technique of dietary surveys, family budgets and the adjustment of family incomes to nutritional requirements. The training undergone by the medical student should be such as to enable him to advise schools, public institutions and industrial concerns in addition to invaluable instruction in household management.

A very important matter in which the public needs enlightenment is that of mealie meal. This substance which forms the staple feed of so large a proportion of the Union's population is admittedly poor in the protective constituents—vitamins, minerals and proteins. Yet milling processes may very seriously deprive it of this scant supply. An article in the July number of *Farming in South Africa* sets this out very clearly. The mealie meal generally regarded by the public as the best, and sold to them as such usually in small bags under patent names, is actually the worst. It has had the germ, bran and fine bran or " seconds " removed from it. These contain most of the protective vitamins and minerals of the mealie. Removal of the germ also deprives the meal of most of its fat content. Maize meal with nothing removed known as " straight run " contains 5 per cent. of fat whereas the highly milled " best " meal contains only 1·6 per cent. The mineral content is reduced from 1·15 per cent. in the " straight run " to only 0·54 in the

" best " meal. The deprivation of lime and phosphorus is particularly to be deplored. The crude meal contains 20 milligrams of calcium and 212 milligrams of phosphorus per 100 grams whereas the " best " meal contains only 17 milligrams of calcium and 93 milligrams of phosphorus per 100 grams. It is evident that the removal of these constituents is not in the best interests of the consumer. Most members of the public, including the Natives, do not specify what kind of meal they desire being under the impression that only one kind exists. To protect the consumer it would be necessary to require the vendor to state what percentage of the original mealie is in his product and what amounts of the various constituents have been removed.

17. *Health and Sanitary Conditions on the Alluvial Diamond Diggings.*—Towards the end of 1936 an inter-departmental committee visited the alluvial diamond diggings to report on their social and economic conditions. An assistant health officer of this Department was appointed a member of the committee, which included health and sanitary circumstances in its investigations.

The control of sanitation on the diggings devolves on the mining commissioners of the respective areas, who are local authorities for the purposes of the Public Health Acts as proclaimed in terms of Act No. 36 of 1927.

Night-soil disposal is by means of pit privies, which vary considerably in design and structure, from substantial closets with suitable seat and riser to mere dilapidated erections of sacking and old iron.

The larger staff on the Lichtenburg fields has enabled a stricter supervision to be maintained with resultant better conditions than in other areas.

In respect of refuse disposal, too, the Lichtenburg fields are better cared for than those of Wolmaransstad and Klerksdorp. In the case of the Barkly West fields the proclaimed areas present few problems, as the diggers do not reside on them, but in villages on unproclaimed ground.

The fly is an inevitable nuisance and danger in such primitive communities as diggings camps, breeding extensively in the litter, refuse and night-soil, which escape the attention of the sanitary staff.

Undoubtedly the anti-fly methods adopted on the Lichtenburg fields have lessened fly-breeding considerably, and in the absence of such measures the situation would become intolerable. Fly prevalence is a considerable nuisance on the Transvaal diggings, but the more orderly arrangements in the settled villages of the Cape areas have prevented its becoming a major problem there.

The water supply of those diggings with some density of population, such as those of Lichtenburg, has presented difficulties. Inspectors of this Department, especially in the days of the Lichtenburg " boom ", had to indicate the health dangers from careless pumping and distribution of water. Natives find the charges for water a heavy burden.

Dwellings vary from well designed, substantially constructed houses showing every sign of care and cleanliness to mere hovels of sacking, old tin, and other odd material. On the Lichtenburg fields an impression was gained that the classes of dwellings could be grouped roughly in the following proportions :—

Good dwellings	10-15 per cent.
Moderately satisfactory dwellings	15-25 per cent.
Poor, inadequate and unfit dwellings	60-75 per cent.

Similar conditions may be said to exist on the Klerksdorp fields, but in the case of the Barkly West area, where the proportion of reputable industrious diggers is relatively high, the dwellings are surprisingly good and satisfactory. In the case of the poorer houses seen, the following defects were common :—

Unsuitable materials, e.g. old iron.
Unsatisfactory design, e.g. smallness of rooms, insufficient window area.
Absence of ceilings and substantial partitions between rooms.
Use of earth floors.
Absence of good cooking or kitchen quarters.

The inability of a large proportion of diggers to provide adequate housing for themselves is but one of the many symptoms of their low economic and social standards.

The committee had thrust upon it on several occasions the pros and cons of poor relief, and very illuminating and diverse accounts were received of the ration question. On the one hand were the urgent appeals for increasing the ration scale, and extending its application, and on the other were equally urgent requests for limiting fraudulent and improper use of this measure. Many of the diggers' representatives were labouring under the false impression that the rations as issued by the various mining commissioners were

intended as a complete food supply. This is obviously not the case. The rations are intended purely as a form of poor relief, a means of supplementing and increasing the provision made by the individual himself.

That the rations are intended only to supplement the diet, remove to a large extent any criticism of their inadequacy as a full and complete food measure. Insufficient though they are as a complete diet, the rations are, nevertheless, sufficiently attractive to serve as the sole reason for the presence on and the influx to the diggings of many families. The provision of free rations is a measure calling for great circumspection in its use, and it is considered that every effort is needed for removing the causes of poverty and want, which lead to the demand for rations, rather than extending such assistance, which only too often breeds a supine attitude and a reliance on State or public for all help and assistance.

An estimate of the prevalence of physical defects and disease was only possible by correlating the evidence of district surgeons and other doctors and welfare officers, with the general impression gained by seeing representative groups on the different diggings. Each district surgeon remarked upon the surprisingly good state of health of the diggings population, considering the conditions of their environment. Severe outbreaks of epidemic disease are practically unknown amongst the Europeans. However, if the annual reports of local authorities and district surgeons are consulted, it will be realised that cases of enteric, dysentery and infantile diarrhoea are continuously occurring, indicative that the insanitary circumstances are not without effect. As water, milk and food supplies are not entirely protected from contamination, it is not surprising that gastro-intestinal infections take their toll. It is only the scattered nature of the communities, the good effect of prolonged sunshine and a healthy climate which have kept these infections in check.

In the non-European, gastro-intestinal conditions, especially in infants and young children, play havoc.

Malnutrition and undernutrition are also obvious in the non-European; in fact the superficial survey which was all that time allowed revealed that numbers in the locations of the diggings, if not actually starving, were but little above a mere subsistence level. Further, the evidence gathered of the type of diet within the means of the average non-European was proof that even if quantity was sufficient, the lack of essential constituents, such as fresh vegetables, milk and meat, was bound to produce malnutrition.

The diet of the European in but very exceptional cases is above starvation level. Rations as well as milk, cheese, and soup issues have held off actual starvation. Nevertheless, some children showed a certain degree of malnutrition, for instance, anaemia, dental decay, and a lack of subcutaneous fat. Besides the poverty, the inability of the various districts to produce quantities of vegetables, milk and fruit, are explanatory of the difficulty of securing an adequate, well balanced diet. The housewife on the diggings is further generally in great need of training in the buying and correct cooking of a suitable diet.

Medical attention and treatment as given by the district surgeon are generally considered to be of a high order, and there is no reason to doubt that the diggings are receiving any less consideration than other communities. The provision of free medical care for paupers on the diggings is unusually good compared with other areas. The district surgeons play, too, a large part in the health and sanitary care of the diggings. Each outlying field is visited regularly, venereal disease cases receive regular treatment, and any infectious disease notification is followed up with preventative measures.

The alluvial diggings areas are fairly well provided with hospital accommodation. It was suggested by some diggers' representatives that additional cottage hospitals were required in the smaller villages and towns. Such requests are not peculiar to the diggings areas, as practically every small town in the Union may be said periodically to ask for hospital accommodation in its own area. Some disadvantages do exist in the absence of small cottage hospitals in each town, as transport of patients is involved, in bringing cases to institutions in larger towns. Nevertheless, without the immense sums necessary to give every town a hospital, it is obvious that the efficiency and economy of such technical institutions as hospitals can only be secured by concentration at strategic points in an area. Small hospitals are expensive to build, equip and staff, and being situated usually in areas where specialist, medical and surgical personnel are not available, their use is limited. Further, in small towns very difficult problems of servicing with water, sterilisation plant, sewage disposal, etc., arise.

The various diggings areas have been inspected by the nursing inspectors of the Department and gatherings have been held at which the recently adopted schemes of subsidised nursing were outlined. This propaganda has resulted in the provision of one or two nurses. There is, of course, the difficulty, in view of the present shortage of nurses, of attracting nurses to areas of the diggings type where living conditions are often unpleasant.

As circumstances on the diggings render decent conditions difficult of attainment for the European, it is not to be wondered at that the lowest classes, the non-Europeans, are living in almost intolerable conditions.

18. *Prevention of Cancer.*—The National Cancer Association of South Africa continues to carry out very valuable propaganda work. This Department is represented on the Council of the Association along with other Government and Provincial Administration representatives. The Association is dependent for its revenue largely upon donations and the subscriptions of its members. This Department has assisted by bearing the cost of a quarterly questionnaire which is sent out to all medical practitioners, hospitals and nursing homes with a view to collecting statistics. These statistics are analysed from time to time. They were used in the preparation of two important papers presented at the International Cancer Congress held in Brussels last September by Dr. M. J. A. des Ligneris, of the South African Institute for Medical Research, a member of the Statistical Committee.

The Department also assisted the Association by collaboration in the preparation as well as in bearing the cost of printing of the pamphlet " Truth about Cancer " which has been very widely distributed. Further assistance takes the form of address and other propaganda work by members of the professional staff of the Department on behalf of the Association. Thus the Deputy Chief Health Officer, Pretoria, addressed the Annual Meeting of the Association on 30th April, 1937, in Johannesburg.

He pointed out that it was in the later years of life that human beings became increasingly susceptible to cancer. Though the soil may from the beginning have been of the right kind and though the seed was sown in early life, it was generally only in late life that it began to germinate. Hereditary taint, even if such does ever exist to provide the suitable soil, and chronic irritation only showed their effects after many years of life.

These are facts which give food for profund thought. In all civilised countries a falling birth-rate is accompanying a falling death-rate. Fewer babies are being born, but those that are born have a longer average lifetime before them. This means that the average age of the population is increasing. The numbers of persons in the later periods of life are increasing at the expense of those at the commencement. Considered from the point of view of maintaining the population up to strength, or enlarging it, a disquieting feature is seen to emerge from this fact. If the process continues, an increasingly large proportion of the population will be of an age at which child-bearing has ceased. In other words, if the present process continues, civilised nations are faced with ultimate extinction.

This is a matter which is exercising the minds of vital statisticians in many countries to-day. But the menace that we are considering is even more direct than this. These older people who are accumulating at the expense of younger ones have entered the " cancer age " and are increasingly being mown down by the dread disease. Increasingly, because there is now ample evidence that the higher incidence of cancer is not accounted for entirely by the larger proportion of old people; that the susceptibility of these old people to cancer appears definitely to be on the increase. In England the death-rate from cancer has become steadily larger, from 0·3 per 1,000 in 1860 to 1·6 per 1,000 to-day. Even in the shorter period since 1911 the mortality from cancer has trebled itself in that country. This is more than can be accounted for by a greater proportion of eldery persons in England to-day or by improved methods of diagnosis. The second point is proved directly by the greater incidence of superficial cancers such as those of the tongue and of the breast which were as readily recognisable fifty years ago as to-day. There has, in fact, been a considerably greater increase of these easily diagnosed forms of cancer than of other forms on which we now depend largely on specialised equipment for our diagnosis. The only vulernable part of the body in which a significant increase is not recorded is the uterus. This can be directly linked up with the lessening amount of damage to that organ associated with the falling birth-rate. To the same factor is to be attributed the increased incidence of breast cancer, since this disease more frequently attacks women who have not nursed infants.

The available figures for South Africa point in the same direction. In 1922 the number of deaths attributed to cancer among the European population in the Union was 1,103 or 70·88 per 100,000. Ten years later these figures had increased to 1,565 and 89·06 respectively; four years later in 1936 they were 1,954 and 97·28. This is a startling increase: From 70·88 to 97·28, that is 26·40 per 100,000 in fourteen years. In our largest city, Johannesburg, the increase is even more startling. In 1922 the number of deaths attributed to cancer in that city was 70; in 1935 it had increased to 229. In five years the number of cancer deaths had increased from 159 (7·8 per cent. of all deaths) to 229 (9·8 per cent. of all deaths). A steadily increasing number of the persons who die in Johannesburg each year, die from cancer.

A rather gloomy picture has been painted. An ageing population becoming less and less able to replenish itself, not only because of its increasing age, but also because of a lessening fertility of the younger members; increasingly a prey to cancer—again not only because of the greater average age, but because of an all-round increase in susceptibility to attack. But hope need not be abandoned. These undoubted facts have not led to a mood of resignation. They are serving rather as a spur, and the amount of investigation into the problems of cancer during recent years is amazing. Almost every country in the world is contributing to this work. In South Africa there are able, enthusiastic and willing workers, but facilities for carrying out this work are still sadly and hopelessly inadequate.

Yet it is very clear that we in the Union have had allotted to us special fields of investigation which are likely, if thoroughly explored, to throw light on the problem. One refers more particularly to the forms in which malignant disease manifests itself in the Bantu. While it is not true, as was at one time believed, that cancer is virtually absent in this race, the figures as examined by Drs. Berman and des Ligneris reveal that it is decidedly less frequent among them. This is almost certainly not due to a racial difference. Most probably it is due to differences of habit. There seems to be a definite increase of cancer of the stomach among them. It is more than mere speculation to connect this up with the fact that the Bantu is increasingly adopting the food of the European and the manner of preparing and eating it—including the increased amount of food, and rate of eating it. Dr. des Ligneris of the South African Institute for Medical Research reports that in the area served by the Elim Hospital in the Northern Transvaal there are less sarcomata among Natives now than thirty years ago. He makes the provocative suggestion that this might be due to the fact that they have taken to clothing and now to a much greater extent protect their skin, legs and feet from the continual irritations to which they were formerly subject. The rarity of foot melanomata among Europeans and Natives living on the Rand and their relative frequency among the Elim Natives point similarly to the probability that exposure of bare feet to thorns, sharp stones and agricultural implements is responsible for the latter. The frequency of liver cancer among Natives from the Portuguese territory may be associated with the commonness of bilharzia infection among young Natives on the East Coast.

Enough has been said to indicate what important work awaits the South African investigator, if he could be provided with facilities.

It is necessary, however, to point out that though much remains to be done, plenty of information is already available on which to act. Almost all forms of cancer can be cured if treated early, by the use of surgery, radium or x-ray, but definitely *not* by drugs and, therefore, *not* by the lay " cancer curer " who is responsible for so much misery through causing delay in the application of effective treatment.

We also have much information now concerning methods for preventing the onset of cancer. The general belief in the heritable predisposition to cancer has been responsible for much discouragement. If cancer is inherited to the extent that is generally believed, then only by choosing one's parents with great discrimination could we protect ourselves. But is there a heritable predisposition to cancer? The belief appears to be supported by experiments on mice. By selective breeding it is possible to intensify so greatly a cancer tendency that all the animals will die of the disease. But it would probably be safe to say that such intensive inbreeding never occurs among human beings. On the contrary the human animal chooses his mate in general away from his family, so that any adverse hereditary element tends to become greatly attenuated. The probability is not that some persons are specially liable to cancer but that most persons could develop the disease if they were exposed to the correct factors. The soil is in general not very fertile, and the seed, in the form of chronic irritation, must be presistently sown if it is to grow.

Our evidence is all in favour of chronic, long continued irritation being the cause of most forms of malignant disease. Many of these forms of chronic irritation are now clearly recognised and can be avoided. Most forms of cancer can be avoided by proper hygienic procedures.

Cancers in the lip, tongue, mouth and throat are mostly the result of long continued bad oral hygiene—chronic irritation from bad teeth, syphilitic lesions and excessive use of tobacco. All these forms of chronic irritation can be removed—the teeth and mouth generally can be repaired and cleaned up by visits to the dentist and proper habits, including moderation in the use of tobacco inculcated; oral syphilitic lesions can be prevented or treated by therapeutic measures.

To avoid cancer of the stomach all forms of abuse of that organ must be guarded against. No single article of diet is known to have any relation to gastric cancer although several valuable foods such as the tomato have been quite unjustly maligned in this connection. Simplicity in diet is to be aimed at. It is significant that cancer of the stomach appears to be increasing among those Natives who have become " civilised " to the extent of eating European foods in the European way.

Cancer of the rectum has a similar association with "civilisation". Complicated feeding, too, commonly results in the chronic constipation which is so frequently a precursor of cancer in this region. The position is in no wise relieved by the fact that civilisation implies greatly limited opportunities for evacuating the bowel.

Cancer of the breast in women is known to be associated frequently with lack of normal function of that organ. It can be readily produced in mother mice by preventing their babies from removing the milk by sucking, and allowing the breast to become swollen with decomposing milk. It can also be produced in the mouse by tying the ducts of the breasts—when the ducts on one side only are ligated cancers develop on that side only. It is now evident that the breast cannot be left with safety to look after itself, particularly in women who have not suckled children. The correct hygiene of the breast requires to be worked out. Early and abrupt weaning is probably a common cause of cancer. Most women who develop the condition have either not had children or lactation has not been normal.

Cancer of the uterus on the other hand is much more frequent in women who have borne children, and it is almost certainly the result of damage to the organ occurring at child-birth. It is probably the small neglected injuries which are chiefly to blame. Preventative measures here are obvious —careful repair of any damage which may occur at the time of delivery, and attention to all abnormal discharges.

Malignant disease of the skin is associated with frequent damage to that organ. The frequency of sarcomata among barelegged Bantus has already been referred to, and also the evidence that it appears to be diminishing with the adoption of dress which results in the protection against the continual irritation of thorns, sharp stones and other objects. There is in any case no excuse for allowing skin cancers to get beyond the curable stage. They are obvious at a very early stage and the precursor conditions are well-recognised: the thickening of the skin round a suppressed hair follicle which signals the probability of a rodent ulcer developing; the flat persistent wart which does not in time disappear, but slowly increases in size; the pigmented mole which steadily increases in size and blackness with a tendency to become warty.

It was pointed out that we are dealing with an enemy which is becoming increasingly menacing throughout the civilised world. In fact it would appear that one of the penalties that backward races have to pay for an advance into civilisation, is an increase of susceptibility to cancer of the digestive tract. In this connection we in South Africa have a special obligation regarding the subject Bantu races. The difference in the habits of those who have not yet become Europeanised needs careful study, being likely to cast a light on the difference in manifestations of malignant disease among them. Our climatic conditions also need careful study. The sunlight survey of the Union which has now been commenced by the Union Health Department (made possible by a generous gesture on the part of Dr. Hans Merensky) is a valuable move in this direction.

The National Cancer Association has as its dream the establishment of a National Cancer Institute in which the problems mentioned could be investigated, from which propaganda for the prevention of the disease could emanate, and where sufferers could come for advice in those early stages in which cure is possible. But the most urgent immediate need is for greater treatment facilities, so that very early or suspected cases need not be turned away. These people should obviously be receiving every encouragement to present themselves for treatment. But such conditions are still very far from obtaining even in Capetown or Johannesburg, with the inevitable consequence that patients, whose lives might have been saved by early treatment, often do not come under medical care until the disease has become incurable.

19. *Solar Radiation Survey.*—As reported last year the munificence of Dr. Hans Merensky made it possible for a sunlight survey to be undertaken in the Union by members of the staff of the Institute of Physical Therapeutics of Jena University, Germany. The observations made by Miss Riemerschmid in the preliminary survey arranged by the Government have already been reported. She returned to the Union in March, 1937, to commence the systematic survey, financial provision for which was made by Dr. Merensky.

This financial provision includes one year's service on the part of Miss Riemerschmid and her assistant and seven sets of valuable instruments for making the observations at different points in the country. Each set contains instruments for the following observations:—

(i) Measuring the total amount of sun and sky radiation, registered every minute on a graph, by means of the self-recording galvanometer with solarimeter;

(ii) measuring "cooling temperature", i.e. the temperature of a steadily heated copper ball under outdoor conditions which gives an indication of the influence of climate, by means of a self-recording galvanometer with cooling ball;

(iii) measurements of the sunlight in the red and yellow portions of the spectrum; direct observations are made using the Michelson bimetal actinometer;

(iv) measurements of the intensity of the ultraviolet sun radiation; the ultraviolet dosimeters used have the same sensitivity for ultraviolet rays as the human skin;

(v) measurements of the short wave ultraviolet sun radiation as far as it causes biological reactions.

The central station for the making of these observations has been erected at the Rietfontein Hospital near Johannesburg. Here all the instruments were thoroughly calibrated by Miss Riemerschmid in order to ensure that they had not suffered during the voyage from Germany. From Rietfontein they were then distributed to the sub-stations which were erected in coastal regions (Durban, Capetown and Port Elizabeth) and inland regions (Nelspoort and Bloemfontein).

At all these stations systematic observations are now being made, mostly by voluntary scientific workers. In Durban, as the tuberculosis hospital has not yet been completed, the instruments were set up at the aerodrome with the Assistant Meteorological Officer, Mr. S. A. Engelbrecht, in charge of the station. At Capetown, the instruments were set up on the roof of the Royal Observatory, the observer, Mr. Driver being in charge. At Port Elizabeth, the station chosen was at the Infectious Diseases Hospital with Mr. Buckley of the City Health Departmentment in charge. At Bloemfontein, the station was erected at the Tempe Isolation Hospital under the charge of Mr. Brennan. At Rietfontein Hospital and Nelspoort Tuberculosis Sanatorium, departmental officers are in charge.

A final sub-station will be erected at the Mont-aux-Sources Hostel. This site was selected because of the probability that this mountain area will develop into a national health resort.

20. *Spider Bite Research.*—The work described in the report of 1935-36 has been continued and the preparation of an antivenene which neutralises the venom of the "Knoppie-Spider", has been brought to a successful conclusion. Stocks of antivenene are maintained at the Union Health Department, Capetown, and during the year 111 phials of serum were issued to physicians. Records of over twenty cases of spider bite successfully treated with the serum have been received and in some cases the recovery following serum administration was most dramatic.

Physicians who desire stocks of serum may obtain them, free of charge, on application to the Union Health Department, Capetown.

21. *Senecio Disease.*—In the annual report for 1928 a brief reference was made to certain cases of poisoning in the districts of Riversdale and George. These cases were discovered to be due to the eating of bread made from wheat intermixed with senecio (*sprinkaanbos*) seeds.

Recently further cases have been reported from the Knysna district. The district surgeon examined a European who appeared to be suffering from senecio poisoning, leading to inquiries being made in the district. Four families of Europeans were traced which had bought quantities of the unsifted meal suspected to be the source of the poisoning. This meal had been prepared in a modern mill, but, nevertheless, the so-called "splinters" or unfertilised flowerets of the senecio plant had not been separated. These small dark "splinters" were noticed by one family which, taking the precaution of sieving the meal, escaped poisoning. It was found necessary to remove four persons from two of the affected families to Capetown for hospital treatment. A child, one of the four, died in Capetown and the others are still undergoing treatment.

Every care should be taken by farmers to eliminate the weeds responsible for this poisoning, *Senecio spp.* from their wheat field, and it is again to be indicated that millers have a responsibility to equip their mills with effective winnowing devices, as is required by section 12 (7) of the Food and Drugs Regulations.

VII.—CONCLUSION.

Summary.—This brief account of the present state of the public health in the Union contains a number of facts which ought to encourage the members of local authorities and those they represent. There has been a substantial advance made during the period since the lifting of the financial depression in 1933 associated with an increasing public appreciation of the claims and necessities of preventive medicine.

The health of the European population, both urban and rural, shows on the whole indisputable signs of steady improvement which cannot fail to contribute to their increased capacity and longer life.

The health of the non-European population has unfortunately not as yet shared in the same improvement. The rapid elimination of slums which is now in progress in most of the larger centres, the rehousing of these people in clean surroundings and the awakening generally of the European to the fact that his own health and that of his family, as well as the prosperity of industry generally, depend in no small measure on the conditions under which the non-European lives, are bound to result also in a striking advance in the health of the non-European resident in our urban areas.

Much is also being planned to better the economic conditions of life in the Native reserves and locations, and a commission has been appointed by the Government to deal with the whole question of farm labourers who are at present most miserably housed and, in many parts of the Union, underfed.

The future prosperity of South Africa seems to me to be inextricably bound up with that of its non-European labour supply. The continued expansion of the gold mining industry, of industrial undertakings and of agriculture, all demand an ever-increasing supply of healthy labourers. The improving of economic conditions amongst non-Europeans would do more than any other single measure to ensure that such supply will be forthcoming.

There is a natural disposition on the part of the public in dealing with health matters to call for quick returns, but in the practice of preventive medicine these cannot always be attained. The growth of science is slow and its findings must often be cautiously applied. Our business is not to build for to-day or to-morrow, but for the future. Most of our problems must be viewed as parts of a whole and slowly but surely we must lay foundations which will endure for all time. I think that it may be fairly claimed that satisfactory foundations have at least been laid during the past six years. The Department of Health cannot, as so many people appear to think possible, move in advance of medical science nor for that matter without that backing from the people without which all instruments of Government are useless, nor can it be a substitute for an enlightened public opinion and a national health conscience. It cannot make bricks without straw nor a coat without cloth. It cannot be expected to function efficiently without experienced professional officers fully trained to deal with its many problems and it cannot possibly substitute for the local authority in whose hands parliament has wisely placed the main business of the execution of a national health policy.

Acknowledgments.—The Department has, as usual, drawn freely during the year on the resources of the South African Institute for Medical Research which the Director—Sir Spencer Lister—has always placed at its disposal. The thanks of the Department are again due to the Board of the Institute and to the Director and his staff for their ever ready co-operation and assistance in connection with many questions affecting the public health.

Résumés of the work done by the South African Medical Council and the South African Pharmacy Board will be found in Annexures F and G. These bodies have continued to render material assistance to the Department and thanks are due to the presidents and members and to Mr. E. Herbert, the Registrar, for the helpful manner in which they have co-operated with the Department.

During the period covered by this report there have been several consultations with the Federal Council and on local questions with various branches of the Medical Association of South Africa. Thanks are due to the presidents and members of these bodies for their kindly co-operation in the discussion of problems submitted to them.

The Department has also again drawn freely on the advice of Dr. P. J. du Toit, the Director of Veterinary Services, on matters affecting the two Department and sincere thanks are due to him and the officers of his Department for great assistance rendered.

Municipal medical officers of health have freely co-operated with the Department and I am greatly indebted to these officials for their kindly help and advice.

I am again greatly indebted to Dr. A. J. Orenstein, C.M.G., Chief Medical Officer to the Rand Mines, Limited, for his ready advice and assistance in connection with mining and many other health problems.

The work accomplished during the past six years has brought the Department into much closer touch with the provincial administrations. While there has not always been complete agreement at first in matters of policy affecting the public health, negotiations have at all times been conducted in a spirit of goodwill, and agreement has been reached finally without difficulty. I am greatly indebted to the heads of the several provincial departments for their co-operation throughout the period with this Department.

In conclusion I must express a word of appreciation of the work done by all members of the staff of the Department. To Dr. F. C. Willmot, who finally retired from the public service on the 8th September, 1937, South Africa owes much. He acted most competently in spite of ill health as Secretary for Public Health and Chief Health Officer during my absence overseas in the first three months of the period under review. I must refer also to the excellent work performed by Mr. A. de V. Brunt, the Under Secretary for Public Health; by Mr. A. Stuart, Chief Clerk to the Department who acted as Under Secretary for a portion of the year during Mr. Brunt's absence overseas; and by Mr. R. S. Gordon, the Chairman of the Central Housing Board. Indeed the services rendered by all the officers of the Department, professional, administrative and clerical, have been of the highest quality and have been given as usual without stint.

I am also again indebted to Dr. E. H. Cluver, Deputy Chief Health Officer, Pretoria, and other officers of the Department for having prepared much of the material contained in this report.

I have the honour to be,

Sir,

Your obedient servant,

E. N. THORNTON,

Secretary for Public Health and Chief Health Officer for the Union.

Department of Public Health,
Pretoria, 5th October, 1937.

ANNEXURE A.

CHART OF DEPARTMENT OF PUBLIC HEALTH *as at 30th June*, 1937

Minister of Public Health (HON. R. STUTTAFORD).

Minister (Chairman.)
Secretary and Chief Health Officer (Deputy Chairman).
Director of Veterinary Services.
Mrs. S. B. Broers.
Messrs. W. J. O'Brien, M.P., and L. C. Serrurier.
Drs. K. Bremer, M.P., A. J. Orenstein, C. P. Theron, and Sir Spencer Lister.

Council of Public Health — *Central Housing Board.*

Chairman: Mr. R. S. Gordon.
Deputy Chief Health Officer: Dr. E. H. Cluver, Messrs. F. Walton Jameson, J. Lockwood Hall, G. R. Savage.
Secretary: Mr. J. Sanders.

Secretary and Chief Health Officer (Sir E. N. Thornton).

Under Secretary (A. DE V. BRUNT).

Departmental Chief Clerk (A. Stuart).

Deputy Chief Health Officer (Dr. E. H. Cluver).†

1 Accountant (L. J. Hatch).

1 Chief Clerk Gr. II. (R. S. Gordon),

3 Principal Clerks. (P. I. Phelan N. A. G. Reeler and J. Sanders.)

3 Senior Clerks.
54 Clerks, Typists, etc.

Sections.

Detached Officers.	Inspection and Field Staff.	Maternity and Child Welfare.	Pathological and Biological Control Laboratories.	Port Health Officers.	District Surgeons.	Leprosy.	Venereal Diseases Hospitals.	Malaria.	Tuberculosis.	Epidemic and Infectious Diseases (Plague, Typhus, Smallpox, etc.), and Vaccination.	Food and Drugs Adulteration; Habit-forming Drugs.	Local Authorities.	Other Bodies.
Capetown: Deputy Chief Health Officer: Dr. F. C. Willmot. Assistant Health Officer: Dr. P. Allan. Durban: Deputy Chief Health Officer: Dr. G. A. Park Ross. Assistant Health Officer: Dr. F. W. P. Cluver. Johannesburg: Senior Assistant Officer: Dr. L. Fourie. S.A. Railways and Harbours: Assistant Health Officer: Dr. C. G. Booker.	Two Assistant Health Officers: (Drs. A. J. van der Spuy and H. S. Gear). Five Inspectors (4 plague and 1 typhus).	Medical Inspector (Dr. E. Drennan). Nurse Lecturers.	Capetown, and Vaccine Institute, Rosebank: (Drs. W. F. Rhodes, R. Turner, C. A. M. Murray). Capetown Biological Control Laboratory: (Drs. M. H. Finlayson and H. A. Shapiro). Durban: (Dr. B. Sampson). *South African Institute for Medical Research, Johannesburg.	Capetown: (Dr. J. M. Bosman). Durban: (Dr. G. A. Batchelor). Port Elizabeth: (Dr. H. W. A. Kay). East London: (Dr. R. V. S. Stevenson). Simonstown: (Dr. A. B. Bull). Knysna: (Dr. J. D. Allen). Mossel Bay: (Dr. F. T. Waldron). Port St. Johns: (Dr. G. H. Meiring).	17 Whole-time. 6 Whole-time. (jointly). 340 Part-time. 363 Total.	*Leprosy Advisory Committee:* Secretary and Chief Health Officer (Chairman): Sir Spencer Lister. Professors A. W. Flaconer, W. H. Craib. Drs. A. Pyper, A. J. Orenstein, K. Bremer, M.P., G. W. Robertson, F. C. Willmot, G. A. Park Ross. *Institutions:* Pretoria: (Drs. J. H. Loots, H. J. F. Wood, P. A. Thornton and H. Pillemer). Emjanyana: (J. A. Macdonald, and Dr. A. R. Davison). Mkambati: (H. C. Bellew and Dr. F. S. Drewe). Amatikulu: (F. J. Roach and Dr. G. D. Stoute). Bochem: (J. H. Franz and Dr. H. C. Franz).	Rietfontein, Johannesburg: (Drs. J. Danecl and N. L. Murray). Kingwilliamstown *Bochem. *Elim. *Jane Furse Memorial. Several smaller hospitals.	Transvaal: Medical Inspector: (Dr. D. H. S. Annecke). Inspectors and Assistants. Natal: Medical Officer: (Dr. A. L. Ferguson). Inspectors.	Nelspoort Sanatorium: (Drs. B. A. Dormer and H. Ackermann). Rietfontein. In addition to these Institutions under the direct control of the Department there is a number of other hospitals where accommodation is available.	Field Staff. District Surgeons. Local Authorities. Magistrates, etc.	Inspectors, Customs, Police, etc. Chemical work done in chemical laboratories of Department of Agriculture at Capetown & Johannesburg. Pharmacist.	237 Municipalities. 101 Village Management Boards. 37 Local Boards. 28 Village Councils. 59 Health Committees. 8 Local Administration and Health Boards. 95 Divisional Councils. 1 Health Board. 158 Magistrates. 5 Mining Commissioners. 729 Total.	South African Medical Council South African Pharmacy Board. Rand Water Board.

* Receives Grant-in-Aid. † Is also Director of Medical Services (Defence).

ANNEXURE B (i).

Pamphlets and Leaflets published by Department of Public Health :—

"Senecio Disease." (Warning Notice.) No. 166 (Health).

"Food and Health." No. 194 (Health).

"Anthrax." No. 239 (Health).

"Venereal Diseases: Their Prevention and Treatment." No. 248 (Health).

"Instructions to Persons suffering from Gonorrhoea." No. 249 (Health).

"Instructions to Persons suffering from Syphilis." No. 250 (Health).

"Instructions to Native Patients suffering from Syphilis or Gonorrhoea." (In Zulu, Sixosa, Sesutu, and Sechuana.) No. 358 (Health).

"Poisoning by 'Stinkblaar' or Thorn Apple (*Datura stramonium* and *Datura tatula*)." (Warning Notice.) No. 256 (Health).

"Smallpox: Duties and Powers of Local Authorities under Public Health Act, and procedure to be followed in dealing with outbreaks." No. 276 (Health).

"Directions for the Performance of Public Vaccination." No. 279 (Health).

"Dagga Smoking and its Evils." No. 289 (Health).

"Plague: A Brief Account of its Symptoms, Clinical Diagnosis, Morbid Anatomy and Treatment." (Drs. D. C. Rees and J. A. Mitchell.) No. 293 (Health).

"Plague: Its Control, Eradication and Prevention." No. 316 (Health).

"Plague Prevention and Rodent Destruction." No. 317 (Health).

"Rodents: Description, Habits, and Methods of Destruction." (W. Powell.) No. 321 (Health).

"Fly-proof Latrines for Coloured Persons." (Dr. G. A. Park Ross.) No. 334 (Health).

"Houseflies: Their Life-history, Destruction and Prevention, and their Influence on Health." No. 335 (Health).

"Bilharzia (Human Redwater) Disease." No. 339 (Health).

"Snake-bite and its Treatment." No. 348 (Health).

"Influenza." No. 363 (Health).

"Typhoid or Enteric Fever: Its Causes, Spread and Prevention in South Africa." No. 365 (Health).

"Catechism about Typhoid or Enteric Fever." No. 378 (Health).

"Care of the Teeth and Prevention of Dental Disease in Children." No. 368 (Health).

"The Teeth: How to Prevent Decay." No. 379 (Health).

"Typhus or Louse Fever." No. 417 (Health).

"Typhus Catechism." (In Zulu, Sixosa, Sesuto, and Sechuana.) No. 488 (Health).

"Consumption, its Causes, Prevention and Treatment." No. 439 (Health).

"Malaria Catechism for use in Schools." No. 360 (Health).

"Truths about Cancer." (Published jointly with the National Cancer Association of South Africa.) No. 473 (Health).

"Rabies." (Published jointly with the Director of Veterinary Services, Department of Agriculture and Forestry.) No. 501 (Health).

"Motherhood." No. 482 (Health).

Malaria Pamphlet No. 1: "Malaria Control with the Description of the Life-history of the Malaria Parasite and the Habits of the Mosquito Vector." No. 527 (Health).

Malaria Pamphlet No. 2: "Directions for the Prevention and Treatment of Malaria and Blackwater Fever." No. 198 (Health).

ANNEXURE B (ii).

List of Cinema Films owned by the Department and which are available to Local Authorities and Public Bodies for Exhibition purposes :—

"Fly Danger."

"The Trail of a Pesky Fly" (small reel).

"The Rat Menace."

"Your Mouth."

"Tommy Tucker's Tooth."

"The Story of John McNeil" (Tuberculosis) (2 reels).

"Consequences" (Tuberculosis).

"The War on the Mosquito."

"Malaria" (3 reels).

"New Methods for Malaria Control."

"Bilharzia" (2 reels).

"Bilharziosis" (Human Redwater).

"In His Father's Footsteps" (Insanitary Farm: Enteric).

"The Long Haul *versus* the Short Haul" (Dirty Milk).

"Milk—the Master Builder."

"Drinking Health" (Pure Water) (2 reels).

"London Water Board."

"Preventing the Spread of Disease."

" The Great Crusade " (Slum Clearance) (2 reels).
" One Scar or Many " (Vaccination).
" Bringing it Home " (Child Welfare).
" Well Born " (2 reels).
" Baby's Bath and Toilet."
" The Best Fed Baby."
" Why Willie was Willing to Wash."
" Forming the Habits of Health."
" Camp Sanitation."
" Any Evening after Work " (Venereal Disease) (4 reels).
" John Smith and Son " (Gonorrhoea) (3 reels).
" Peter and the Moon Man."
" The Story of Papworth " (2 reels).
" Almost a Tragedy " (2 reels).
" Jinks."
" The Priceless Gift of Health."
" Confessions of a Cold."
" Deferred Payment ". (3 reels) (Venereal Disease).
" Trial for Marriage " (3 reels).
" Giro the Germ " (2 reels).
" Milk " (2 reels).
" Enough to Eat " (2 reels).
" Enough to Eat " (2 reels: 16 mm.).

ANNEXURE B (iii).

A set of small models, specially made for the Department by health inspectors, is stocked by the Department's health officers at Pretoria, Capetown and Durban for loan to local authorities and other bodies for demonstration during " health weeks " and on similar occasions, and for illustrating lectures on hygiene. Each set includes a model for illustrating—

(1) method of rodent-proofing buildings;
(2) an " open-air " room for home segregation of a tubercular patient;
(3) Baber's maggot-traps;
(4) Russel's modified maggot-trap;
(5) Russel's modified box fly-trap;
(6) squatting closet for Native use;
(7) hygienic dairy.

ANNEXURE C.

PORTS OF THE UNION: HEALTH MEASURES DURING THE YEAR ENDED 30TH JUNE, 1937.

Particulars.	Capetown.	Durban.	Port Elizabeth.	East London.	Mossel Bay.	Knysna.	Port St. Johns.	Simonstown.	Port Nolloth.	Total.
Vessels dealt with	1,588	1,605	883	772	476	20	—	69	56	5,469
Cases of infectious or communicable diseases dealt with	210	597	4	2	—	—	—	—	—	813
No. of Vessels involved	125	214	3	2	—	—	—	—	—	344
Disinfections and fumigations—										
Vessels	40	116	3	2	—	—	—	—	—	116
Consignments of second-hand clothing and other articles	2	19*	15	—	—	—	—	—	—	36
Deratizations under International Sanitary Convention—										
No. of Vessels Deratized and Certificates Issued	1	82	—	—	—	—	—	—	—	83
No. of Exemption Certificates Issued	13	59	—	—	—	—	—	—	—	72
Rats Destroyed on Vessels and in Dock Area	2,719	578	2,394	682	749	—	—	—	—	7,122

* In addition, the bedding and personal effects of 1,520 Indian passengers were disinfected.

ANNEXURE D.

ANNUAL REPORT OF THE SOUTH AFRICAN RAILWAYS AND HARBOURS HEALTH ORGANISATION. 1936-1937 (EXTRACTS).

By Dr. C. G. Booker, *Assistant Health Officer (Railways) for the Union.*

ORGANISATION.

As anticipated in the last annual report of the Railway Health Organisation, the period of the twelve months ended June, 1937, has witnessed the completion of the field organisation throughout the full nine Systems, during which a very satisfactory consolidation of prophylactic health and hygiene measures has been effected within the routine of the Transportation Organisation.

The work of this section is becoming more widely understood and the placing of the Health branch on each System in immediate conjunction with the Civil Engineering Department has resulted in a wider measure of co-operation between the interests of Public Health and the projects of Transportation. Evidence of the useful part played by the Health Staff is in some measure given in the fact that the appointment of a Health Inspector (relief duties) at Headquarters has been found necessary in order to preserve continuity of services on Systems at times of sickness or annual leave.

A Senior Health Inspector was appointed during the year for the purpose of assisting me in the co-ordination of the work and to take part in major investigations.

Two further important phases of the work assumed during the year are for Catering Services and Workshops Hygiene. Inspectors have been appointed to investigate the respective phases of each and although attached to the Departments concerned, are stationed at Health Headquarters which directs the policy to be followed. An outline of the scope of their duties and the progress made during the few months of operation in these important divisions is given later in this report.

As a Government Department the local authority for the Railway Administration is the Minister for Public Health, and the resultant absence of definite regulations or by-laws applicable to the Department very often gives rise to the practice of multifarious standards of public health throughout the wide ramifications of the service. For the furtherance of public health measures a wide understanding of the peculiarities of railway working is a *sine qua non* in both policy and staff and for this reason a domestic health organisation in full co-operation with the policy of the Central Government is absolutely essential. The early policy of this organisation to follow the broad standards of Act No. 36 of 1919 and associated legislation has been continued and by the principle of education of the railway mind towards these standards it is pleasing to report that instances of obstruction or opposition seldom if ever occur.

One remaining difficulty in the foregoing connection which I desire to mention at this stage is that controlling officers are still prone to overlook the fact that this office is available in an advisory capacity for the inauguration of schemes where drainage, housing and the adoption of routine affecting the comfort of the travelling public and welfare of the staff play a very important part, quite apart from the presence of the organisation as a corrective body. The result very often is that such advice is not sought until schemes have proved difficult to handle or certain matters affecting hygiene have become aggravated. With the present large development programme this point is one which cannot lightly be overlooked.

Acknowledgment is made of the help afforded by the Railway Sick Fund, which has shown a readiness to co-operate in matters affecting preventive health work generally and in the advice and prevention of infectious disease.

A satisfactory basis of co-operation with the various offices of the Union Health Department and Port Health offices has been maintained during the year.

I wish to express appreciation and thanks to System Managers and their staff for the large measure of support accorded to me in the sphere of field routine and for their whole-hearted co-operation in the various proposals put forward from time to time for the improvement of structural conditions affecting hygiene. Without such support very little could have been achieved.

Malaria Control Measures.

This phase of the work continues to be of paramount importance on the two Systems, Eastern Transvaal and Natal, and is given preference over other works during the season November to May.

The policy remains unchanged. This briefly is:—

(*a*) The eradication of the mosquito by permanent measures by the drainage, reclamation, fencing and tree planting of land.

(*b*) Seasonal measures which aim at the destruction of the vector *A. gambiae* by larvicidal and insecticidal means when it appears. In endemic areas the policy of efficient gauzing of habitations is strictly maintained.

Seasonal Measures.

(1) *Transvaal.*

Throughout the season climatic conditions were favourable for the breeding of *A. gambiae* and *A. funestus*. During February the meteorolgoical conditions were so extremely adverse as to cause an almost complete suspension of control measures by reason of the fact that oil was washed away as fast as it was sprayed on the water, and much of the permanent work of previous seasons was destroyed. The high water table resulting from the excessive rainfall was responsible for seepages where previously these had never been known to exist and swamps and springs developed beyond recognition. Together with the innumerable pools created by receding rivers these conditions were responsible for an enormous increase of mosquitoes and the proportionate increase of oil and insecticide used. To cope with the unprecedented conditions which obtained, particularly in the Northern Transvaal, extreme anti-adult measures had to be resorted to and the normal weekly spraying of houses was increased to thrice weekly and even daily in certain areas. The abnormal infestation of adults will be observed from the data given in Table A reflecting the total catches in the two Provinces.

To meet epidemic conditions on the terrain north of Pretoria an additional Health Foreman was drafted from the Western Transvaal for the month of April. This area is usually unaffected by malaria vectors.

The period February to April was an anxious one and although the malaria incidence in the Transvaal shows a considerable increase over previous years, little disorganisation of the service took place. In spite of marooned trains and large gangs dealing with washaways the staff and their dependents were never reduced to the same depressing state as the inhabitants of neighbouring farms and villages and the occupants (mostly Natives) of waste areas where no control was exercised. There is no doubt but that such areas had a very adverse effect on the control measures of this Department by reason of the high infectivity rate of mosquitoes penetrating the half-mile radius of railway control. This factor in normal years is negligible. Under present circumstances of indifference to control in rural areas of the Transvaal such epidemics are inevitable and costly to those who are willing to co-operate. The epidemic area was entirely north and east of Pretoria, and owing to the normal rainfall did not touch the potential malaria area west of Pretoria.

Larvicides.—17,684 gallons of Shell anti-malaria mixture were used for the treatment of breeding places, an increase of 4,284 gallons over the previous season.

The sections are:—

(*a*) *Waterval Boven-Nelspruit.*—One Health Foreman, four Native oilers with three oil pumps and one pressure insecticide pump. Assistance was also given by the Komatipoort gang.

(*b*) *Nelspruit-Komatipoort.*—One Health Foreman (Nelspruit) assisted by the Health Foreman at Komatipoort, seven Native oilers and the Komatipoort gang of nine labourers plus oil and insecticide pumps.

(*c*) *Zoekmakaar-Rubbervale.*—One Health Foreman, five Native oilers with equipment. Gangers on the Selati line were supplied with spray facilities from this section.

(*d*) *Zoekmakaar-Beit Bridge.*—One Health Foreman and five Natives.

(*e*) *Zoekmakaar-Potgietersrust* (Emergency Section).—One Health Foreman *ex* Western Transvaal, two casual Natives to assist the permanent oiler.

Insecticides.—The proprietary product pyagra mixed with paraffin 1-20 was used. 1,341 gallons of this mixture were used, an increase of 724 gallons over the previous season. Each section worked with one prima pressure pump.

Very good co-operation was maintained with those local authorities who undertook control measures and with the field staff of the Union Health Department. Valued co-operation was received from the progressive farmers at Mataffin and Kaapmuiden where the interest of these private individuals and those of railways are closely allied. Mutual assistance was rendered in oiling and spraying. Similar arrangements existed at Duivelskloof. The Municipalities of Pietersburg and Louis Trichardt spared no effort to make their control effective and their assistance was of great benefit to the Department.

The incidence of vectors is given in Table A following this section.

(2) *Natal.*

" Spotting " began on the coastal sections on the 1st October and inland on the 1st December.

Meteorological readings were fairly high towards the latter part of the season and favourable for the breeding of *A. gambiae*. Owing to heavy rains extensive breeding took place in March. Anti-larval control was, however, effectively maintained. At one period breeding was partly uncontrolled on section E (Empangeni-Nkwaleni-Gollel) owing to the motor trolley being under repair. The train service only had to be relied upon and it was found impossible to check up the oiling of certain breeding places.

Larval catches for Natal show a decided decrease over the previous year for the period October to February, owing to the dry spell existing at most stations. *A. gambiae* adults first made their appearance in December when intensive insecticidal spraying began. At Mkuzi and Hluhuwe spraying was undertaken tri-weekly and at Gollel daily towards the end of the season. In addition to routine section spraying by Health Foremen, the staff at outstations and on Road Motor Transport routes were provided with pumps and insecticide where local vector findings so dictated. The staff as a whole took a keen interest in spraying out their own dwellings and where any slackness was evident the Health Inspector found little difficulty in again securing co-operation from the responsible parties. The regular insecticidal spraying of trains travelling through malarious areas took place and very few complaints were received.

The gauzing programme was accelerated during March following upon the imperfect state of mosquito proofing at Empangeni.

At Felixton, Gingingdhlovu, Port Durnford, Mandeni and Empangeni, new non-European barracks were erected to replace old buildings and in every case opportunity was taken to site them at some distance from the nearest European habitation.

The state of housing generally in the coastal area has been greatly improved and favourably reflects the reduced incidence in malaria in this area.

The policy has been adopted of drafting the Health Foremen from a non-malarious area to section E during the heaviest period of the season to assist in coping with the unusually high infestation of buildings in that area.

No comment is necessary in connection with the illness amongst employees as the campaign has shown a progressive improvement in control in this Province and for the year under review is almost negligible. The standard of co-ordination between adjoining authorities continues to be very high.

There can be little doubt that the progressive success can be ascribed to the extremely low infectivity rate of the mosquito since breeding iself was unquestionably high. Low infectivity spells very fine organisation over years with no uncontrolled " islands " in infected areas. With the constant interchange of human carriers between Zululand and the controlled belts, there is every reason for the continued maintenance of strict control measures by all concerned, as, if these are once relaxed the infectivity of the mosquito may one day suddenly lead to a disaster comparable to 1932.

The following is a record of adult and larvae mosquitoes collected by the field staff, identified and reported at weekly intervals during the season. The figures represent the catches in both Provinces.

TABLE A.

	GAMBIA.		FUNESTUS.		OTHER SPECIES.	
	Adults.	Larvae.	Adults.	Larvae.	Adults.	Larvae.
1936—						
November	58	24	1	—	6	42
December	76	46	—	—	6	180
1936—						
January	190	281	10	—	67	469
February	1,266	645	13	—	142	729
March	10,922	1,723	112	8	484	541
April	5,021	841	23	6	59	421
May	411	361	—	—	40	241
TOTAL	17,944	3,921	159	14	804	2,623

Larvicides.—11,862 gallons of Shell anti-malaria oil were used. Four-Oaks Knapsack Pumps were still found to be most reliable. Many of the pumps have been in use for five years are are still in good condition.

The sections are :—

(*a*) *Reunion-Harding-Umzinto.*—One Health Foreman and two Native oilers.

(*b*) *Verulam-Durban-Rcunion-Georgedale-Cato Ridge.*—One Health Foreman and six Natives.

(*c*) *Verulam-Tugcla.*—One Health Foreman and five Natives.

(*d*) *Eshowe-Tugela-Felixton.*—One Health Foreman and five Natives.

(*e*) *Nkwaleni-Empangeni-Gollel.*—One Health Foreman and six Natives.

(*f*) *Cato Ridge-Estcourt and Branches.*—One Health Foreman and three Natives.

(*g*) *Estcourt-Charlestown-Piet Retief and Branches.*—One Health Foreman and three Natives.

All sections are provided with oil pumps and one insecticide prima pressure pump.

Insecticides.—1,734 gallons of diluted pyagra were used during the season.

Permanent Anti-malaria Measures.—During the off-season, that is, June to October, permanent anti-malaria measures were undertaken. The work was carried out in the Transvaal by two Health Foremen, a squad ganger, and thirty-eight Natives, whilst in Natal, one Health Foreman and twenty regular Native oilers concentrated mainly on the North Coast.

The nature and the amount of work effected during the year is shown in the table below.

TABLE B.

	NATAL.	TRANSVAAL.	TOTAL.
Subsoil drains.....pipes	—	—	—
stone	19 yards.	—	19 yards.
Open drains.....concrete	20 ,,	125 yards.	145 ,,
stone	6 ,,	—	6 ,,
earth	8,450 ,,	6,890 ,,	15,340 ,,
Drains, cleared and regraded	385 ,,	—	385 ,,
Training of stream banks	2,250 ,,	945 ,,	3,195 ,,
Depressions and borrow pits filled in	230 ,,	192 ,,	422 ,,
Fencing	—	200 ,,	200 ,,
Trees planted	1,680 trees.	100 trees.	1,780 trees.

ANTI-RODENT AND PLAGUE MEASURES.

As one of the major forms of routine work undertaken by the Health service, this work which was reorganised some four years ago on a Union wide scale has been further consolidated during the year and is being performed on a satisfactory basis.

The policy outlined in previous years has been continued. It provides for the linking up of the Railway Health Organisation throughout the country

with the plague prevention measures of local authorities and the Central Government; the constant destruction of rodents; the disturbance of places of rodent nesting and harbourage; and the prevention of the latter by improved structural conditions.

Telephonic advices of twenty-seven outbreaks of plague or suspected plague were received from the Union Health Department, Pretoria, during the year. The information was conveyed by telegraph to the health inspectors concerned, who arranged in each case for the despatch of staff to the nearest railhead where all departmental buildings and out-going goods likely to conceal rodents or fleas were deverminised until quarantine over the affected areas was raised. Rodent colonies in the surrounding veld were exterminated and where necessary assistance was given to the staff of the Union Health Department or local authority. With the exception of the one imported case at Benoni no plague occurred on Railway premises.

The following outbreaks of plague or suspected plague were dealt with or assisted in by the Department's staff:—

Orange Free State.

July, 1936.—Two outbreaks occurred, one in the Koffiefontein district and the other near Bloemfontein.

August, 1936.—Two outbreaks. One 19 miles south-east of Jacobsdal and the other 16 miles from Dewetsdorp.

September, 1936.—One outbreak in the Heilbron district. This also affected Gottenberg Siding.

October, 1936.—A few outbreaks occurred; one 26 miles south-west of Wepener, another 7 miles north-east of Edenburg; a fresh outbreak in the Koffiefontein district and the last one for the month was reported from the Winburg district.

November, 1936.—An outbreak 20 miles south of Philippolis was being dealt with and another near Jagersfontein.

December, 1936.—Two outbreaks. One 25 miles south-east of Edenburg and the other in the Kroonstad district.

January, 1937.—One outbreak near Dover station.

February, 1937. A recurrence in the Heilbron district.

March, 1937.—Another case 4½ miles west of Heilbron.

April, 1937. One case was reported 16 miles from Bothaville and another four miles north-east of Bloemfontein.

Cape Midland System.

September, 1936.—On the east side of Rosmead, one case.
October, 1936.—Thirty miles from Willowmore, four cases.
December, 1936.—Six miles from Glenconnor, two cases.

Cape Eastern System.

Outbreaks during September last at Allandale and Schoombie were dealt with by the Rodent Foreman.

Western Transvaal System.

One outbreak occurred. The case, a relative of one of the staff at Benoni was an imported one from Heilbron where the victim broke quarantine. Suitable precautions were taken in conjunction with the Benoni Municipality.

Natal System.

A suspected case of pneumonic plague was reported from Matatiele and at the request of the Union Health Department, the Inspector, two Health Foremen and equipment accompanied an Assistant Health Officer to the scene of the outbreak. A number of rodent specimens were forwarded for laboratory examination, all of which proved negative. Very full protective measures including the gassing of all quarters and buildings were carried out until all danger of the spread of the disease was past.

Cape Northern System.

No outbreaks. (A major outbreak occurred in Rhodesia and in co-operation with the Union Health Department precautionary measures were taken at Mafeking in cases of contacts arriving in the Union.)

Cape Western System.

No human plague occurred. Heavy rodent mortality occurred in the Beaufort West and Riversdale areas which necessitated careful watching. Periodical surveys were made by the Rodent Foreman and veld rodent destruction measures were undertaken.

Fluctuations in the rate of domestic rodent infestation continue as in the past. Heavy infestations still occur at isolated commercial and industrial

centres, but on the whole the sections of line are much freer. Troublesome centres have been largely tabulated and the fault is one rather of the existence of harbourage due to the proximity of dilipated buildings, etc., in areas awaiting development. Very few complaints were received from stations resulting from damage to goods in transit, and regular supervision by the Rodent Foreman assisted in the prevention of aggravated infestation of buildings.

An exceptionally heavy veld infestation of multimammate mice occurred on the Natal North Coast section between Hluhluwe and Gollel. Special measures were taken to check the invasion which did considerable damage to the area in question. Further heavy veld infestations took place on the Natal main line between Glencoe Junction and Newcastle, on certain sections of line in the Orange Free State, Cape Midland and Cape Western Systems. In view of the importance of this aspect to plague transmission it is being carefully watched.

During the year the organisation assumed rodent control over the Mafeking-Bulawayo (excluded) section and an inspection on the position revealed heavy veld infestation.

There is a marked decrease in the infestation at stations where the goods sheds are rat-proofed. In cases where the premises of adjacent private owners are infested difficulty is experienced in keeping station buildings and other departemental structures which are not ratproofed, free, but more often than not the proofed goods sheds mark the difference.

Extermination of Rodents and Disinfestation.

The same methods have been employed as in the past. Cyanogas is the most relied upon measure, and one which in plague control gives the greatest safety as it destroys the flea as well as the rodent. Poison, which is used in the spreading of baits is also extensively used, particularly in veld infestations where grain is the bait employed. Traps and cages are used in conjunction with the foregoing methods and at centres where the Foreman is carrying out rodent work as a side line to other duties. Many Foremen own specially trained dogs which are used for nosing out, etc., in confined spaces.

The following figures reflect the numbers of rodents destroyed during the year under review:—

System.	*No. of Rodents Destroyed.*
Cape Western	4,797
Cape Northern	1,524
Cape Midland	4,724
Cape Eastern	825
Orange Free State	8,817
Natal	2,946
Western Transvaal	4,448
Eastern Transvaal	4,185
TOTAL	32,266

Rodent-Proofing.

Consistent progress has been made in this important work during the year. Although the rodent-proofing of a building is a statutory requirement in the Union, it is a measure which has been very little insisted upon generally, by reason of the burden of cost thrown upon the primary producer, who is most usually affected by rodent infestation and by the inferior class of structure. Unfortunately in many rural areas where the railway interests are affected by rodent infestation there exists no local authority controlling the standard of buildings erected and the absence of proofing goes unnoticed until the next visit of the Rodent Inspector of the Union Health Department when it is too late.

DOMESTIC WATER SUPPLIES.

The survey of domestic water supplies commenced in 1934 has made satisfactory progress during the year. Although not yet entirely complete, the larger centres and those where inadequate and unpotable water supplies exist have received first attention. Regular sampling of supplies by the health staff at camps and on sections is undertaken. Samples are submitted for bacteriological examination at the laboratory of the Railway Chemist, Salt River, who in due course advises System Managers of the results.

Improvements involving the protection of the supply from surface pollution, the substituting of deep supplies for surface ones, improvement to the storage and distribution systems and chlorination of surface supplies are put in hand in order of urgency.

Many improvements have yet to be effected but the number of faulty supplies is rapidly diminishing and steps are being taken to ensure that the remedied supplies are kept safe by regular and systematic sampling.

The automatic chlorination plant mentioned in last year's report has now been completed and a dozen experimental plants have been made in Johannesburg to be tried out under field conditions on all systems. When these have been proved to work satisfactorily the number of polluted supplies will be greatly and economically reduced during the course of the next few years.

Wayside tanks are still a great source of trouble, due to conditions enumerated in previous reports. But it is pleasing to note that they are gradually being reduced and where it is absolutely necessary to retain them, a more hygienic type of tank and method of delivery have been installed. This tank allows for proper flushing out and is provided with pump and overhead storage, which allows for the laying on of water to individual houses.

Supplies which show pollution when sampled are investigated by the inspectors concerned, who submit their recommendations to their respective System Managers.

The following table shows the state of the domestic supplies throughout the Union :—

TABLE II.

System.	Total No. of Supplies.	Total No. of Samples taken.	— 10 e.e.	— 10 — 5 e.e.	— 5 — 1 e.e.	— 1 e.e.	Surface contamination.
Cape Western	471	120	72	9	20	13	6
Cape Northern	122	39	17	4	6	7	5
Cape Midland	183 (incomplete)	48	29	3	11	5	—
Cape Eastern	107	49	28	2	9	7	3
Orange Free State	217	92	79	2	4	7	—
Natal	271	29	11	3	4	11	—
Western Transvaal	228	221	145	18	23	26	9
Eastern Transvaal	219	115	70	9	21	13	2
South West Africa	199	79	50	6	3	4	16
	2,017	792	501	56	101	93	41
TOTAL			63·3%	7·1%	12·7%	11·7%	5·1%

A comparison of these figures with those of last year shows a reduction of contaminated supplies from 16·4 to 11·7 per cent.

Besides the betterments already effected various systems have a programme for further improvements to water supplies and it is hoped to make financial provision each year for the gradual elimination of faulty supplies.

ANNEXURE E.

VACCINATION OF INFANTS AND CHILDREN IN THE CLASSES OF THE POPULATION WHICH REGISTER BIRTHS, YEAR ENDED 30TH JUNE, 1937.
(These figures do not include Re-vaccination of the 12-year old Children.)

Particulars.	Cape.		Transvaal.		Natal.			Orange Free State.	Union.
	Cape District.	Remainder of Province.	Rand Area.	Remainder of Province.	Durban.	Pieter-maritzburg.	Remainder of Province.		
Births Entered in Vaccination Register	14,293	39,388	13,941	11,746	2,447	776	1,814	4,896	89,301
Successfully Vaccinated	11,519	3,277	4,142	5,807	1,134	362	849	2,728	29,818
Insusceptible to Vaccination	42	46	256	138	76	17	27	102	704
Vaccination Postponed owing to Illness	291	244	1,285	1,514	362	146	284	1,458	5,584
Previously had Smallpox	7	—	—	—	—	—	—	—	7
Deaths of Infants under Two Years Registered	3,191	3,047	858	607	185	43	139	239	8,309
Exempted under Section 10, Act No. 15 of 1928	43	100	202	169	178	21	73	71	857

ANNEXURE E.—(*Continued*).

Re-Vaccination of Twelve-year-old European Children in Natal, Year ended 30th June, 1937.

Particulars.	Durban.	Pietermaritzburg.	Remainder of Province.	Total.
Registration of twelve-year-old European children	1,520	483	1,266	3,269
Successfully vaccinated	991	276	803	2,070
Insusceptible to vaccination	73	78	117	268
Vaccination postponed owing to illness	48	12	43	103
Previously had smallpox	—	—	—	—

ANNEXURE F.

THE SOUTH AFRICAN MEDICAL COUNCIL.

Résumé of Business for the Year ended 30th June, 1937.

The ordinary half-yearly meetings of the Council were held as well as several meetings of the various standing committees. During the year the following registrations were effected: 166 medical practitioners, 20 dentists, 212 medical students, 6 dental students, 549 nurses, 347 midwives and 2 masseurs. Of the nurses and midwives registered 433 of the former and 314 of the latter had obtained certificates of competency by passing the Council's examinations. Of the medical practitioners registered 116 had qualified at South African medical schools, and of the remainder a number was South Africans who had proceeded overseas for the prosecution of their studies. Of the dentists registered 7 had qualified at the University of the Witwatersrand.

Owing to the reported shortage of nurses in the Union there was an influx of nurses from overseas and of the nurses registered 116 held certificates of other countries, 41 coming from the Netherlands and the remainder coming mainly from Great Britain, Australia and the United States of America.

The number of persons whose names appeared in the various registers on the 30th June, 1937, was as follows:—

Medical practitioners	2,883
Dentists	728
Medical students	917
Dental students	20
Nurses	6,281
Midwives	4,084
Masseurs	50
Dental mechanicians	119

It will be observed that the number of medical students in the register is lower than that for the previous year. As anticipated in last year's report, steps have been taken to erase the names of those who have discontinued their studies at the South African medical schools; some of these, it is probable, have proceeded overseas for the prosecution of their studies.

Examinations for nurses and midwives were held half-yearly. The table below shows the number of candidates who presented themselves for the various examinations and the number who passed:—

Examination.		Presented.	Passed.
Medical and Surgical Nurses	Final	372	360
	Preliminary	569	416
Male Nurses	Final	9	6
	Preliminary	22	12
Mental Nurses	Final	68	54
	Preliminary	162	95
Nurses for Mental Defectives	Final	13	13
	Preliminary	48	26
Midwives		357	314

The numbers of candidates for the examinations for medical and surgical nurses and for midwives show substantial increases as compared with the previous year, the candidates for the nurse's examination showing an increase of 55 and for the midwives an increase of 26. It is anticipated that further increases will be shown during the coming year for the following reasons:—

(*a*) The decision of the Council to hold full examinations for nurses every quarter instead of half-yearly.

(*b*) The recognition of a number of additional institutions as training schools.

The Council has conducted preliminary investigations into a large number of complaints made against persons registered under the Medical, Dental and Pharmacy Act, but in only one case was it found necessary to hold an inquiry as provided by Chapter IV. The penalty imposed in this case was a reprimand and a caution.

A vacancy in the membership of the Council occurred during the year owing to the death of Dr. D. J. Wood. Dr. Wood was a member since its inception and had rendered valuable services. Dr. F. P. Bester was the sole nominee to fill the vacancy and was, therefore, declared elected.

The Council has been approached by the Medical Council of India with a view to granting recognition to the medical degrees of that country. Certain of the degrees of India are recognised by the General Medical Council of Great Britain and this Council has informed the Medical Council of India that it will be prepared to recommend to the Minister of Public Health that these degrees be recognised for registration in the Union provided that the medical degrees of the universities of South Africa are given full recognition by the Medical Council of India.

ANNEXURE G.

THE SOUTH AFRICAN PHARMACY BOARD.

Résumé of Business for the Year ended 30th June, 1937.

The usual half-yearly meetings of the Board were held in July, 1936, and January, 1937, and, in addition, three special meetings were held besides several meetings of the standing committees. The half-yearly meetings of the Board each lasted for three days and a large volume of business was transacted at each meeting. The Board also met representatives of the South African Medical Council to discuss amendments to the habit-forming drug regulations and the two bodies were thus in a position to submit a joint recommendation in regard thereto to the Minister of Public Health.

During the period under review the registration of 61 chemists and druggists, of 19 managing directors of companies carrying on the business of chemists and druggists, and of 46 apprentices was effected. Of the persons registered as chemists and druggists 7 held the certificate of the Pharmaceutical Society of Great Britain, their registration being effected by virtue of the reciprocity agreement entered into with that body; the remainder held the qualifying certificate of the Board. On the 30th June, 1937, the names of 1,360 chemists and druggists, 126 managing directors, and 156 apprentices appeared in the Board's registers. It will be observed that the number

of apprentices has decreased from 231 in the previous year to 156. This is due to the fact that 121 had completed their apprenticeship and their names were, therefore, deleted from the register.

Examinations were held in December, 1936, and June, 1937. The following tables show the results:—

PRELIMINARY SCIENTIFIC EXAMINATION.

	Number of candidates examined.	Passed.	Failed.	Referred.		
				Botany.	Chemistry.	Physics.
Whole Examination.....	94	22	52	9	2	9
Botany only.....	16	7	—	9	—	—
Chemistry only.....	3	3	—	—	—	—
Physics only.....	16	10	—	—	—	6
Total.....	129	42	52	18	2	15

QUALIFYING EXAMINATION.

	Number of Candidates Examined.	Passed.	Failed.	Referred.		
				Chemistry.	Pharmacy.	Dispensing.
Whole examination.....	84	21	34	8	1	20
Chemistry only.....	17	9	—	8	—	—
Dispensing only.....	30	20	—	—	—	10
TOTAL.....	131	50	34	16	1	30

NOTE.—Candidates for examination in only one subject were previously referred for further study in that subject. By passing in that subject they are accepted as having passed the whole examination.

The complaints received by the Board in regard to the conduct of chemists and druggists have been few and usually of such a nature as not to justify action being taken under its disciplinary powers. It has, however, been obliged to hold inquiries into two cases where chemists and druggists had been convicted of breaches of the law. In one case the chemist had been convicted on several counts under the liquor law of supplying liqour to unauthorised persons: the Board ordered the Registrar to erase his name from the register. In the other case the chemist had been convicted on a large number of counts of contravening the Medical, Dental and Pharmacy Act by practising as a medical practitioner. The inquiry was opened but the accused was unable to attend owing to ill-health and it was later reported that he had died. The proceedings were then abandoned.

The Bill to amend the Medical, Dental and Pharmacy Act, 1928, referred to in the last report was re-introduced into parliament during the recent session and became law. It deals with apprenticeship, the functions of a chemist and druggist, the sale of poisons by general dealers, the carrying on of the business of chemists and druggists by corporate bodies, and the conduct of the business of a chemist and druggist, and generally speaking clarifies the provisions of the Principal Act in relation to these matters. Powers are given to the Board to frame rules relating to the requirements in a pharmacy where an apprentice is being trained and these should prove of great assistance to the Board in the furtherance of its policy that an apprentice should receive adequate training from his master and not merely be regarded as a form of cheap labour.

A change was made in the personnel of the Board during the period under review, Mr. E. C. Davies being appointed under section 2 (7) of the Act in place of Mr. W. H. Millar who had ceased to hold office in respect of which he was appointed.

	Price (Post Free within the Union). s. d.
Prevention of Cruelty to Animals Act No. 9, 1914, as Amended to 1933	1 0
Trade Act No. 26, 1920, with Regulations thereunder	0 3
Transport of Goods between the Union and Rhodesia—Regulations regarding the	0 3
Trade Act No. 13, 1920, as Amended to 1933	1 0
Workmen's Compensation Act No. 27, 1914, as Amended to 1925	0 6
South African Act, 1910, with Amending Acts to 1933	3 0
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MISCELLANEOUS PUBLICATIONS.

Annual Statement of Trade and Shipping of the Union of South Africa and the Territory of South West Africa, 1936	42 0
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Supplementary Recommendations for Customs Tariff Amendments, 1936 (No. 208)	1 0
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Onderstepoort Journal of Veterinary and Animal Science Industry:	
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Volume VII, No. 1, July, 1936	5 0
Official Year Book No. 18, 1937	5 0
Resisting Drought. By Reenen J. van Reenen	2 0

PUBLICATIONS OF GEOLOGICAL SURVEYS.

The Geological Commission of the Cape of Good Hope.

(*a*) *Annual Reports:*

Fifteenth Annual Report, 1910	2 6

(*b*) *Geological Maps of the Colony of the Cape of Good Hope:*

Seventeen sheets were published in colour on the scale of 1 : 238,000, or 3·8 miles to the inch. Price 2s. 6d. each.

1. Capetown–Robertson, 1906. (Out of print.)
2. Swellendam – Riversdale 1907.
4. Malmesbury – Ceres, 1907. (Out of print.)
11. Clanwilliam, 1911.
13. Beaufort West–Fraserburg, 1911.
19. Nieuwerust, 1912.
26. Barkly East, 1912.
32. Van Wyks Vlei, 1910.
33. Britstown, 1909.
40. Marydale, 1910.
41. Griquatown, 1909.
42. Kimberley, 1908. (Out of print.)
45. Postmasburg (Griqualand West), 1907.
46. Barkly West, 1908.
49. Kuruman, 1908.
50. Vryburg, 1908.
52. Mafeking, 1908.

The Geological Survey of Natal and Zululand.

Second Report, 1904	7 0
Third and Final Report, 1907	7 0

The Geological Survey of the Transvaal.

(*a*) *Annual Reports:*	s. d.
Annual Reports for 1909—109 pages and 14 plates (including 6 maps). Deals with portions of Waterberg, Rustenburg, Middelburg, Lydenburg, and Marico Districts, also the Klip River Valley	7 6
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Maps.	
(*c*) *Geological Map of the Transvaal:*	
No. 6.—Mafeking. (Explanations by A. L. Hall and W. A. Humphrey.) 1910	5 0
(*d*) *Special Publications:*	
Report on a Reconnaissance of the North-West Zoutpansberg District. By T. G. Trevor and E. T. Mellor. 40 pages, 16 plates, and 1 map. 1908	

The Geological Survey of the Union of South Africa.

(*a*) *Annual Reports* (discontinued after 1913):	
Annual Report for 1911. 114 pages and 14 plates (including 3 maps). Deals with Central Witwatersrand, portions of Rustenburg District (including the Pilansberg), Vryheid District, and Zululand. Also a Report on the Coal Resources of South Africa	7 6
Annual Report for 1913. 116 pages and 9 plates (including 4 maps). Deals with portions of Barberton, Carolina, Piet Retief, and Wakkerstroom Districts, Transvaal; Ngotshe Division and Alfred County, Natal; Namaqualand and East Griqualand, Cape Province	7 6
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(c) *Sheet Maps*, published in colour, each accompanied by an Explanation. (Price 5s. each, complete):

Transvaal Province. Scale 1 : 148,750, or 2·35 miles to the inch.

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No. 8.—Sekukuniland (Explanation by A. L. Hall). 1911.
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No. 15.—Crocodile Pools } naston and W. A. Humphrey). 1920.
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No. 51.—Bethal (Explanation by F. A. Venter). 1934.
No. 53.—Ventersdorp (Explanation by L. T. Nel, etc.). 1935.
No. 68.—Piet Retief (Explanation by W. A. Humphrey and L. J. Krige). 1931.

Cape Province. Scale 1 : 238,000, or 3·8 miles to the inch.

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No. 247.—Capetown (Explanation by S. H. Haughton). 1933.
No. 150.—Sundays River (Explanation by S. H. Haughton). 1936.

Natal Province. Scale 1 : 148,750, or 2·35 miles to the inch.

No. 102.—Vryheid (Explanation by W. A. Humphrey and L. J. Krige). 1932.
No. 109.—Nkandhla (Explanation by A. L. du Toit). 1951.

(d) *Special Publications:*

Geological Map of Natal. Prepared by the Mines Department of Natal prior to 1910. Scale 20 miles to the inch. 1910.....	0 9
Report on the Oil Shale in Impendhle County, Natal. By A. L. du Toit. 1910.....	1 0
Geological Map of the Witwatersrand Gold Fields, with Explanation. By E. T. Mellor. Two sheets. Scale 1 : 60,000. (Price: Unmounted £1. 10s.; mounted on cloth, with rollers, 1917.	
Geological Map of the Country around Heidelberg. Scale 1 : 60,000. With an Explanation by A. W. Rogers. 1922..	
Geological Map of the Country around Vereeniging. Scale 1 : 63,360. With an Explanation by Louis T. Nel. 1927..	
The Geology of the Possible Phosphate Deposits. Scale 1 : 40,000. With an Explanation by Louis T. Nel. 1929..	
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(e) *Bulletins of the Mines Department, Geological Survey:*

No. 1.—The Witwatersrand System in the Klerksdorp-Ventersdorp Area. A Preliminary Report. By Louis T. Nel. 1934.....
No. 2.—The Andalusite Sands of the Western Transvaal. By F. C. Partridge.
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MAPS.

Miscellaneous.

Map of Johannesburg Municipal Area, in nine sheets, showing the townships, streets, roads, main routes, schools, churches, mining properties, etc. Scale 1 inch to 50 Cape roods. Price, £1. 1s. or 2s. 6d. per sheet.

Rainfall Map of the Union (on paper).....

Skeleton Map of the Union, size 25 inches by 21 inches. Scale 1 : 3,000,000.....

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